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MODERN GYNECOLOGY

A TREATISE ON

DISEASES OF WOMEN

COMPRISING THE RESULTS OF THE LATEST INVESTIGATIONS AND TREATMENT IN THIS BRANCH OF

MEDICAL SCIENCE

BY

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PUBLISHER'S NOTE.

THIS work is designed to fill a place in progressive medicine, and because of its need is here; not as an Encyclopædia or Manual covering the whole subject, but as a treatise on the *practice of to-day*, "what to do and how to do it" in the department which it covers.

In the belief that the author has to a large degree fulfilled the expectations set forth in its title (and we measure his fitness for the task by his large experience on lines indicated), and that the general practitioner will find its claim fully sustained in the helpfulness afforded in its timely suggestions, improved methods, and most recent treatment embodied herein, the undersigned has been induced to undertake its publication, and place it at the head of the list of "Medical Classic" hand-books.

E. B. TREAT.

INTRODUCTION.

THE number of books on the diseases of women is already large—so large that it may well be a question if the matter is not already overdone. A glance at the size and pretension of these works, however, will show that they are all written from one standpoint, that of the specialist. But what of the family physician, of the general practitioner? What is being done for him? This query is especially appropriate for the man who graduated twenty, fifteen, ay, even ten years ago. When the facilities to-day offered in the best medical colleges for acquiring a knowledge of the diseases of women are compared with those these men had, can we wonder they feel unprepared for this class of work? When they seek to post themselves they are offered a book as large as the volume from which they studied the entire subject of "Practice of Medicine" when a student. Is it surprising that busy men should feel their time inadequate for mastering so large a subject? Yet these men are the very ones who should know *well* the essentials of gynecology. To the family physician the women of the family naturally turn as the friend and adviser on whom they can rely. He has been with them during all other forms of illness, and is expected to advise them now. The older women have been

attended in confinements by this physician, and feel they can go to him without reserve. They are particularly disinclined to go to a stranger for advice concerning the diseases peculiar to their sex. The delicacy women naturally feel about alluding to their sexual organs is less in speaking to the man who has been present at the bedside when their children were born, and who has also attended those children in all their illnesses. The younger females of the family go to him more readily for the same reason—he is a kind friend and adviser in whom they can trust.

Then to whom else shall the women go? It is only in the larger cities that specialists are easily accessible. Even when near at hand, he is a stranger, he has not the knowledge of the medical history of the entire family already known from long years of observation by their family physician.

In addition to the above reasons for first consulting the general practitioner is the additional one that women are only beginning to learn that they can receive relief. The past generation of women were taught to suffer in silence, and their daughters have learned much of the same stoicism from them. The non-medical part of a community is always behind its medical men. They are expected to enlighten it on subjects of this nature. Some women have just learned from a more progressive physician that suffering is not woman's necessary lot. These tell others, and as a result they are all seeking relief. If the family physician cannot give it, some will be content to suffer on, the rest will go for advice elsewhere.

The general practitioner should be competent to give these women the advice asked. There is nothing in the routine work

of gynecology requiring more skill than a case in General Medicine. The instruments and appliances are few, and a knowledge of their use is readily acquired. It is essential to acquire dexterity in making examinations to the same extent that a knowledge of how to examine a heart or the lungs is essential. This dexterity can only come with much practice. The sense of touch can only be educated by many trials. In the same way the use of the speculum, sound, tenaculum, and applicators must be learned. These manipulations are not many nor complicated, and are easily mastered.

The effort of this book is to place before the physician a clear, common-sense statement of the symptoms of the various diseases of the female sexual organs; to indicate in detail the methods of treatment that can be applied by him, and also to indicate in brief the methods requiring the aid of a specially trained consultant of larger experience. It is as important to be able to appreciate the need of a major operation requiring a surgeon's help as it is to know the proper remedy to apply where special advice is not required. How many cases of cancer of the cervix might be cured if the physician first consulted knew the importance of the symptoms and acted promptly in having it removed! If one woman is saved so horrible a death I shall not have written in vain.

In preparing this volume no effort has been spared to make it complete and comprehensive. Many of the illustrations have been made from photographs taken specially for it. Others have been drawn by an artist under the immediate supervision of the author, and all have been executed with every attention to detail and correctness available.

I am indebted for valuable suggestions and the observations of cases to Dr. F. LeRoy Satterlee, Dr. Paul Outerbridge, Dr. John Woodman, and Dr. Robert J. Devlin, of New York, and Dr. J. W. Houston, of Oxford, Pa., and desire to express my appreciation of their assistance at this time.

C. H. BUSHONG, M.D.

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MODERN GYNECOLOGY.

CHAPTER I.

EXAMINATIONS.

THE first information in regard to her condition is obtained from the patient herself, and consists of an historical account of her past life and a description of her present symptoms. This information is obtained partly by allowing the patient to tell her own story and partly in answer to questions asked her by the physician.

The Oral Examination.—Many patients tell a clear, straightforward story, and can be trusted to give their own history with but little in the way of questioning, while others will ramble on aimlessly, talking about trivialities which only confuse and lead nowhere. In no department of medicine will the physician's tact be called upon more frequently than in the endeavor to obtain a definite history of some obtuse patient's gynecological past life.

A good beginning in inquiring concerning her history is to ask her age and civil condition—that is, if she is single, married, or widowed. It is important to know at what age she began to menstruate, and the presence or absence of any

abnormalities about the flow, its quantity, regularity, and duration, both during the first months and after. The amount of pain should be told, the number of days the flow lasts at each period, and the duration of time between each menstruation.

If she has been married, the number of children must be asked, and it is well to know the date of the birth of the first and last. Information regarding the character of the labors will naturally follow, and if the deliveries were with the aid of instruments or not. If she has had miscarriages, the period of gestation at which they occurred and the cause in each case are important. Inquiry should be made if children have been born at full term since the last abortion. If she has had children since the last abortion, it is important to know how long they have lived and if in good health. If dead, the cause of death will give light on the subject. This information may give an intimation as to the presence of syphilis or tubercular disease in mother or fetus.

It is advisable to try and learn if the patient has suffered from attacks of any kind of pelvic disease, and especially if she has had a pelvic peritonitis. This the physician must learn by her description of the symptoms and not by her simple statement, as women frequently have erroneous notions in this respect.

The condition at the present time requires investigation next, and it will be discovered if she is menstruating or not, or if she is pregnant, and if so, the probable date of conception. She should always be asked if she has leucorrhœa and its amount and character, and if it is more immediately before or after the menstrual flow.

The importance of learning the true state of the alimentary canal must be remembered. Constipation is the bane of civilized woman, causing many of her ills. All the resulting aches, pains, and indigestions are so common as only to need mention to reveal their importance.

The condition of the bladder is at times of special importance to the gynecologist in making a diagnosis, dysuria and incontinence being frequently the result of pressure from the genital organs.

In the case of young girls and unmarried women the duties of the physician require much delicacy and care. The patient should always be accompanied by her mother or some married woman, and the inquiries can at times be made through her. She will usually come because of some abnormality about her menstruation, and the companion will generally have been informed of the main symptoms beforehand. If such is not the case, the questions must be put in such a way as to allow her to tell her story as briefly as is possible and at the same time furnish full information for the diagnosis. Anything calculated to shock her sensibilities should be carefully avoided.

The Physical Examination.—Many pelvic diseases resemble each other in symptoms to such an extent that a diagnosis can rarely be made without a physical examination. The object of the verbal examination is more to establish the probability of any disease in the pelvis than to learn its character. The symptoms complained of are often invaluable as aids in making the differential diagnosis in conjunction with the physical signs found on examination. It is consequently essential to both physician and

patient that the physical examination be as thorough as it can be made. At the same time it is important that the discomfort of the patient should be reduced to a minimum. Consequently every general physician should have in his office the facilities for examining the pelvic organs of the female. The first desideratum for the convenience of both is an examining chair or table. There are many good ones in the market, the more elaborate being expensive. It will be found that the simplest are the most convenient and durable.

The Examining Table.—A table four feet long, two and a half feet high, and twenty-seven inches wide, is all that is absolutely needed. The foot-rest may be the ordinary iron stirrup to rest the heel in, and should be so arranged that it can be readily removed when the table is to be used for other than the dorsal position. Many tables do not have a stirrup at all, the heels simply resting on the table. It is convenient at times to have the table feet adjustable, making it possible to raise the one end higher than the other. This can usually be cheaply arranged.

Most tables are covered with leather, and padded to make them more comfortable; a small leather-covered pillow also adds to the patient's comfort. Very stout women lie more comfortably if a head-rest is provided that is higher than the ordinary pillow.

A sheet or mantle is also needed to cover the patient while on the table, and should be placed so as to save her from exposure of her person as far as possible. It can be held in front of her while she raises her clothing in getting on the table, and after she is there she should be arranged

under this covering, and all examinations and treatment should be done with the sheet so arranged about her as to expose none of her person or underclothing that is not absolutely necessary.

Positions on the Table.—The positions on the table of chief importance to the minor gynecologist are three: the dorsal, the Sims, and the genu-pectoral.

The Dorsal Position (Fig. 1) is most used in the United States, and is most convenient for both patient and physician. The patient lies prone, with the hips as near the end of the

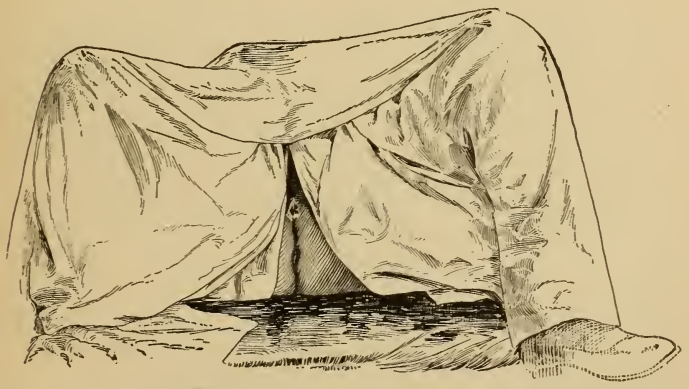

Fig. 1. The Dorsal-Recumbent Position. (From photograph, expressly for this work.)

table as possible; her heels are placed as near the buttocks as is comfortable and held there by a stirrup, the knees being widely separated. She will appreciate the delicacy which prompts the examiner who wraps a sheet around her in such a manner as to completely cover each leg down to, and including, the foot.

A thorough and searching digital examination can only

be made when the hips are well down to the end of the table. The use of the bivalve speculum is also much more satisfactory when this simple precaution is taken. In making first examinations it often requires some patience to get the patient to understand what is required of her.

The Sims Position (Fig. 2) is less used by the general practitioner because, until recently, it required the service of a nurse or assistant to hold Sims speculum. In this

Fig. 2. The Sims Position. (From photograph, expressly for this work.)

position the patient is placed on her left side with the left arm and shoulder drawn back. The left side of the face and chest is in contact with the table. The right shoulder is bent over forward as near to the table as is possible without turning the hips, the knees are then drawn up toward the chin, the right or upper leg being more bent than the left or under one. The corset and all tight clothing must be removed from about the waist, leaving the abdominal walls entirely free. The result is that in this position the

tendency of the pelvic organs is toward the diaphragm. They are consequently more difficult to reach by the examining finger, yet the advantages of this position are many and it is frequently used. It is especially convenient for operations through the vagina where, the patient being under an anæsthetic, two assistants would be required to hold the knees if she were in the dorsal position. The ease with which the uterus can be drawn down by drawing on the cervix with a tenaculum makes it easily accessible for operations.

The Genu-pectoral Position (Fig. 3) is indicated by its name. The patient kneels on the table with her chest on the same level, the face being turned aside; the hips are thus elevated above the shoulders, consequently the position can be used to cause gravity to assist in replacing flexions and versions

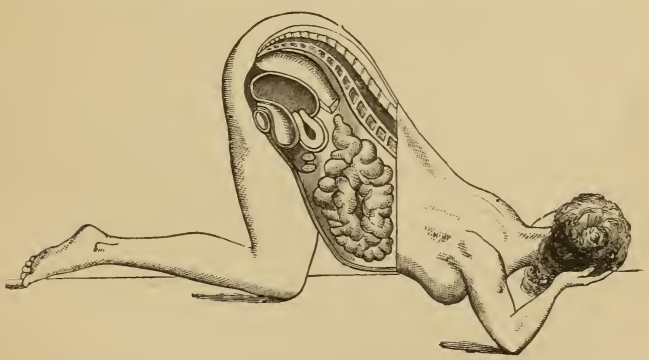

Fig. 3. The Genu-pectoral Position.

of the uterus and some forms of prolapse of the pelvic organs. It is also convenient when it is desired to pack the vagina very tightly with tampons. Entire freedom of the waist and abdominal walls from all restraint is necessary

before assuming the knee-chest position. Figure 3 shows the knee-chest position and the tendency of the abdominal viscera toward the diaphragm.

The physician will succeed with his pelvic cases who can make an examination with delicacy and gentleness yet with sufficient thoroughness to obtain all the information required. Mention of some of the necessary details in making examinations will not come amiss here.

The External Examination.—After the patient is correctly placed on the table the examination should be made in the following order: examination of external organs, digital examination, and examination with specula.

Inspection of the External Genitals.—The first step in examining the genital organs of a woman is inspection of the external genitalia. This is usually done with the patient in the dorsal recumbent position, the examiner sitting between her feet. The labia majora can be seen as far as their cutaneous surfaces extend. The labia minora at times are developed largely and extend out between the greater labia. The condition of the mons veneris can be noted, parasites being looked for, and the perineum and anus are in full view. After these external parts have been thoroughly inspected the labia majora can be separated, each being drawn aside by a small piece of cotton held between the thumb and index finger of the hand most convenient to it. This exposes the whole of the external genitalia to view (see Fig. 4). The clitoris with its prepuce is seen above with the labia minora partially inclosing it as they unite just below it and gradually diverging as they pass backward. Between them is the vestibule with the urethral orifice near the middle

of its lower margin. Next below the vestibule is the opening to the vagina, more or less closed by the hymen when present, or surrounded by its remnants when it has been ruptured. If the hymen has completely disappeared the carunclæ myrtiformes may be present, in which case

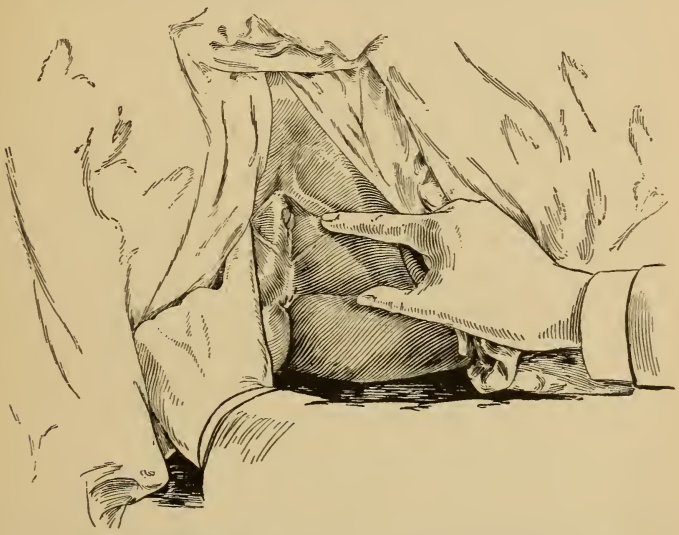

Fig. 4. Separation of Labia and Buttocks. (From photograph, expressly for this work.)

they may be seen surrounding the entrance to the vagina just above the point at which the hymen is attached, when present. If the labia majora are widely separated the fossa navicularis can be seen at the posterior edge of the vaginal opening, and the condition of the perineum can be inspected at the same time.

Inspection of the Anal Region.—Pressure with the examiner's thumbs against the buttocks will separate them and enable him to see the condition of the anus (see Fig. 4),

revealing the presence or absence of prolapsus, piles, or congested vessels there. Ulcers about the anus will also be seen.

While many words are required to describe all these things, the examination necessary to learn all that is required can be made in a very few seconds. It is important to know if ulceration, parasites, or filth are present on or around the external genitals before making an examination of the vagina, as a matter of self-protection for the examiner, if for no other reason.

When an examination of the pelvic organs is to be made through the vagina, the position and preparation of the patient on the table are first attended to as has been outlined in describing the positions on the table, care being taken to protect her as much as possible from exposure of her person. The examiner should not be abrupt in his approach to the sexual organs and yet should use sufficient despatch to avoid prolonged manipulations or tiresome waits in cramped positions.

The Digital Examination.—Everything being ready for a digital examination, the preparation and position of the hand used in examining is next considered. The first point is which hand to use. The majority of physicians use the right hand for the same reason that they employ this hand to write, etc., because they can use it more readily. Some instructors in gynecology, however, have advised the use of the left hand for a number of reasons, the chief one being that it leaves free the stronger right hand to be used in depressing the abdominal wall in making bimanual examinations. It is better to educate both hands and thus be

enabled to use either in case of emergency. A cut on the finger or other cause may make it advisable not to use an injured hand. Another reason for using both hands is that at times more definite information can be obtained by examining either side of the uterus and the lateral fornix with that finger which will allow the palmar surface of the finger to rest against the uterine wall. The greater acuteness of the sensations from the palmar surface of the finger insures more definite information from its use than can be obtained by depending upon the back of the finger with its nail and less sensitive cuticle.

The Position of the Hand in making examinations is of importance. The position usually advised is not the one calculated to gain the greatest amount of information, nor is it the most comfortable to the patient. Most examiners require to add to the distance they can reach with the finger by depressing the perineum and pushing it upward as far as possible. If this is attempted with the external fingers flexed into the palm, as is usually advised (Fig. 5), the distance gained is not great, and the patient will complain of the discomfort caused by the knuckles of the middle and ring fingers. These fingers should not be entirely closed, neither should they be entirely extended, as is shown in this outline (Fig. 6), but they should be held in a partially flexed condition, as shown in Figure 7. To be exact, the chord of

Fig. 5. Position of Hand usually advised.

the curve of the external fingers should make an angle of about forty-five degrees with the line of the index finger.

In this position the hand is introduced under the covering, the index finger having been anointed with vaseline or some other lubricant. The index finger should be flexed into the palm of the hand until the perineum is reached, to prevent soiling the underclothing of the patient in all examinations where she is not thoroughly protected by a sheet.

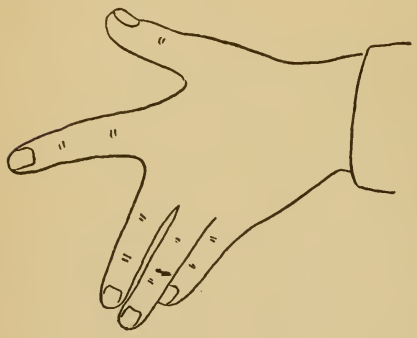

Fig. 6. Position of Hand advised by Davenport.

When the perineum is touched by the knuckle the index finger is extended, its point pressed against the perineum and allowed to pass forward until it slips between the labia majora into the vagina. As soon as the finger enters the vagina, pressure should be made by its side against the perineal body, depressing it in the direction of the tip of the coccyx as the finger passes up toward the cervix. When the web between the index and middle fingers reaches the perineum, that part is carried still further

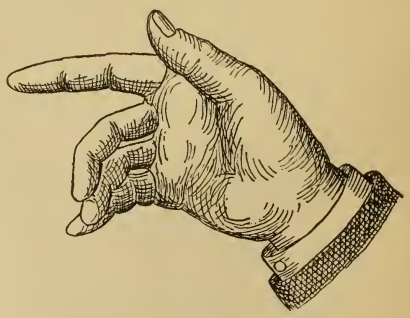

Fig. 7. Correct Position of Hand.

upward by it, enabling the examining finger to reach far up at the side of the uterus, behind it or in front between it and the bladder. The middle finger will lie in the crease between the buttocks, which is depressed with the perineum, so that the external fingers are not in the same plane with the index finger. The angle of divergence between the index and the other fingers varies, of course, as the finger within the vagina passes to one side or the other of the cervix.

The Use of Two Fingers per Vaginum.—Some examiners advise the introduction of two fingers into the vagina. This is a custom not to be recommended in routine practice. Like the bimanual method of examining, it has its uses, but is not required except when indicated by special conditions.

It is painful to many women to have two fingers thrust into the vagina, and even multipara with large, roomy pelves complain of discomfort. The impression gained as to size, shape, and consistency is not more definite with two fingers than with one, as two impressions will at times confuse the examiner and leave an uncertainty in his mind until one finger is removed and the index finger gives its conclusive report.

When there is doubt as to whether a mass is movable with the uterus or not, it may give information to introduce the middle finger behind the cervix and hold it in contact with the tumor or fundus in Douglas' pouch while the index finger makes pressure on the anterior side of the cervix. The same maneuver is also used to start the retroflexed fundus upward as the first movement toward its reposition. In usual routine cases the index finger will give all the information obtainable with least inconvenience to the patient.

Examination per Rectum.—Where additional information is needed it may be advisable to explore the rectum. This is done with the index finger prepared as for vaginal examination and held in about the same position. The tip of the finger is introduced through the anal ring very slowly and gently in order to give the sphincters time to relax. If the patient will "bear down" slightly the entrance is more easily effected.

The finger in the rectum can be passed higher in the pelvis than in the vaginal, and more definite information re-

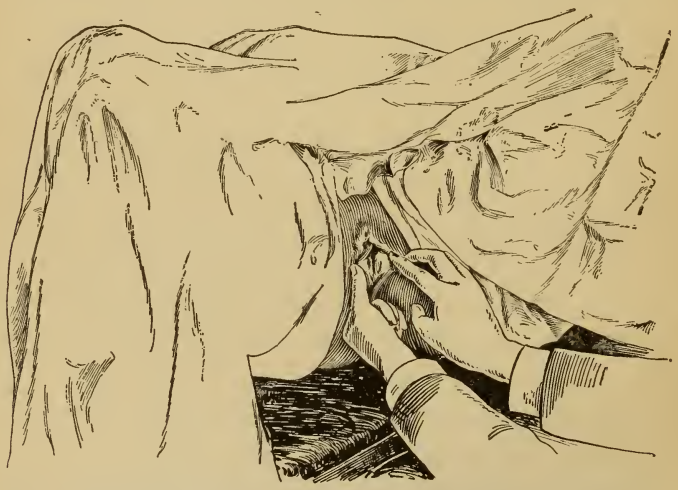

Fig. 8. Eversion of Posterior Vaginal Wall, with Finger in the Rectum. (From photograph, expressly for this work.)

garding the condition and position of the posterior of the uterus can be obtained. The position and size of the ovaries and tubes can be better learned per rectum, also the condition of the utero-sacral and the broad ligaments.

Occasionally it is of advantage to introduce the middle

finger into the rectum and the index finger in the vagina at the same time. This is not often necessary, but is at times required.

Inspection of Posterior Wall of the Vagina.—When it is required to inspect the posterior vaginal wall a finger is introduced into the rectum until its tip passes the sphincters. It is then pressed forward, everting the lower part of the posterior vaginal wall, exposing it to view. The labia are separated to give a clearer view by pressing the one to the examiner's right with the right thumb (the right index finger

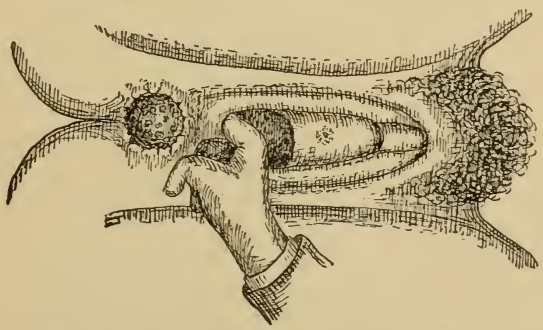

Fig. 9. Digital Eversion of the Rectum. (Mundé.)

being in the rectum), the other labia being held aside by the index finger of the left hand. In this manner the posterior vaginal wall can be inspected a considerable distance upward unless the perineum is very resistant. A photograph of this position is shown in Figure 8.

Inspection of Mucous Membrane of the Rectum.—By a reversal of the above-described process the interior of the rectum can also be examined, two fingers depressing the posterior vaginal wall and everting the rectum (Fig. 9). In either of these maneuvers care must be taken when the sep-

tum is thin between the rectum and vagina or the ends of the fingers may break through, making a recto-vaginal fistula.

Bimanual Examinations.—A bimanual examination is occasionally required to give more information of the pelvic contents than can be obtained by examination through the vagina and rectum. The method of making such examination is simple. The index finger of one hand is introduced

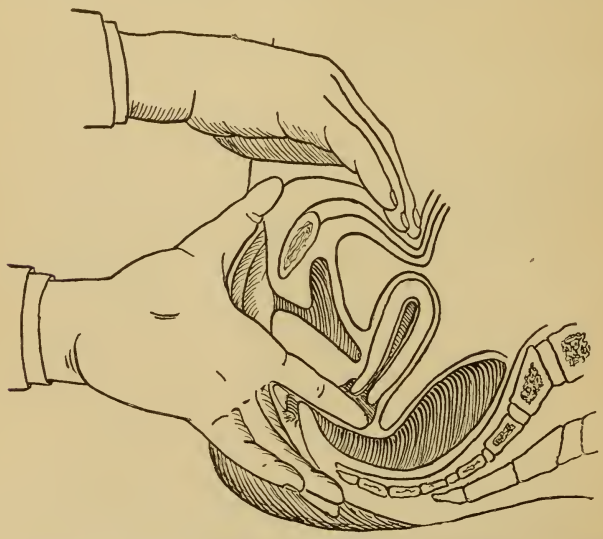

Fig. 10. Relative Position of Hands in Bimanual Examinations. (Davenport.)

into the vagina as in making a digital examination, and the other hand is placed on the abdomen just above the symphysis pubes. This hand rests with its palmar surface against the abdominal wall, the fingers being partially flexed. Pressure is made gently but firmly against the abdominal muscles, depressing them just above the pelvic brim until the fingers sink into the pelvis. The depression

can be made deeper and more quickly if the greatest force is used while the patient makes a deep expiration, slightly relaxing the pressure during inspiration. Figure 10 shows in outline the relative positions of hands and pelvic organs

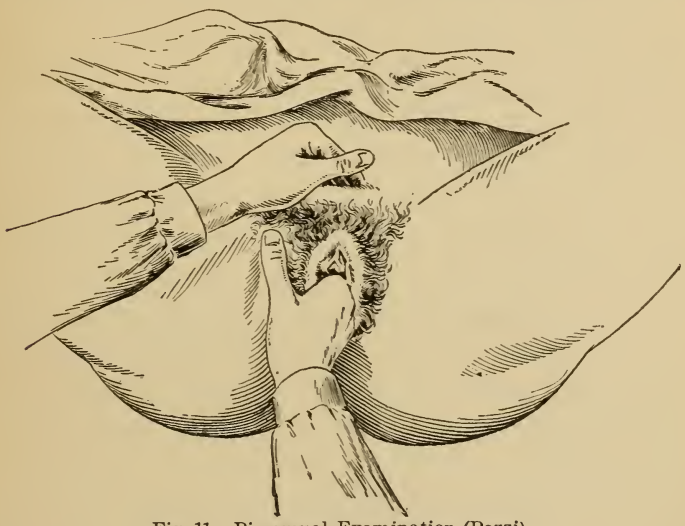

Fig. 11. Bimamual Examination (Pozzi).

when making a bimanual examination. Figure 11 is a photograph of position of hands in making a bimanual examination.

The Object of the hand on the abdomen is to depress the pelvic organs and bring them down in the reach of the finger within the vagina. The size and consistency of the uterus, the ovaries, or a pelvic tumor can be made out by getting it between the hands in this bimanual method. When it is desirable to get a finger into the uterine cavity counter-pressure on the fundus with the hand on the abdomen will be of assistance. The uterus is forced down over

the finger in the vagina and pressure upward on its ligaments and other attachments is avoided. The hand on the abdomen can frequently render valuable assistance in reposition of uterine displacements or in restoring an inversion.

Some examiners use the bimanual method as a part of each pelvic examination. This is unnecessary, as a perfect knowledge of the true position and condition of the important organs in the pelvis can be obtained without it, except in a few special cases. The hand on the abdomen is not pleasant to the patient, the pressure exerted often causing pain. If the abdominal walls are thick or rigid much pressure must be used to get the hand depressed enough to be of any assistance. If the patient is nervous it may be impossible for her to relax the abdominal muscles sufficiently to allow any depression above the symphysis. In addition to the above objections to a bimanual examination as a matter of routine is the fact that the pressure of the hand above pushes the organs toward the pelvic outlet and changes their position in the pelvis and in relation to each other, thus giving the examiner a false impression in regard to them.

The aid of the hand on the abdomen is required in cases of enlargement of the uterus from pregnancy (where the probable age of the fetus is to be ascertained) or from any other cause. It is also of assistance in locating the size and consistency of tumors in some cases of ovarian disease when those organs are not displaced, and rarely it is needed in uterine displacements.

Considerable practice is required to enable an examiner to make a diagnosis from an examination made with the finger in the vagina only, but many of the most reliable diagnos-

ticians make very few bimanual examinations. The more accurately the examining finger is trained, the nearer it comes to being ample for all but the rarest contingencies.

Digital Examination in Sims' Position.—The directions for making a digital examination have all been given, supposing the patient to be in the dorsal position. A like examination can be made with her in Sims' position. The right hand is used and the position of the fingers changed so as to occupy the same position in relation to the patient as when she is in the dorsal position.

By reaching the left hand forward above the thighs to the abdomen a bimanual examination can be made while the patient is in this position also.

Digital Examination in Genu-pectoral Position.—Digital examination is not often made with the patient in the knee-chest position, but when indicated it can be made with little difficulty. When this position is taken for diagnostic purpose the perineum is elevated either by the fingers or a Sims speculum; but as it is a tiresome position for the patient to keep for any length of time, it is best to have her change to the Sims or dorsal position as soon as possible.

Examinations through the Urethra and Bladder.—Cases rarely occur in which it is necessary to introduce a finger into the bladder in making examinations. In cases of atresia or entire absence of the vagina, one finger in the bladder and another in the rectum will enable the presence or absence of the uterus and its appendages to be demonstrated. In order to use this method the urethra must first be dilated with graduated sounds to admit the finger, care being necessary to avoid rupture of the sphincter vesicæ and

thus causing incontinence of urine. When for any reason an examination of the ureters is required the urethra is made to admit the finger in the same way. The index finger with a catheter or sound along its palmar surface is passed into the bladder, the trigone is found by the sense of touch and the instrument guided into each ureter. This operation is too seldom required to call for further description here.

Examinations with the Patient Standing.—Examinations are at times made with the patient standing. The examination is thus made to ascertain the presence and amount of prolapse present, the organs returning more or less to a normal position when the patient is reclining. When about to examine a patient in the erect position she is instructed to place one foot on a stool or low chair and the physician kneels on one knee before her. The hand is then introduced beneath the clothing and the index finger inserted into the vagina. The position of the cervix and fundus are first noted, after which the patient is requested to strain down in order to learn the degree of relaxation of the uterine attachments.

Examination of Single Women.—The sexual organs of single women should not be examined unless the indications for it are strong; this is especially true of young girls. No feelings of modesty should prevent the physician from advising an examination when it is needed in order to clear up a diagnosis, but unless the symptoms are urgent no great harm will result from an effort to cure the patient without an examination. Internal remedies will relieve some pelvic conditions and certainly merit a trial before

subjecting a young girl to the ordeal of being examined. Her amenorrhœa and leucorrhœa are likewise frequently results of mal-conditions of the general system which internal medication will remove. When general treatment is begun the mother should be told of the possibility of a failure to effect a cure without exploring the pelvis and advised that it should be done in case of such failure.

Some persons entertain the idea that examination by a female physician is less objectionable. Many of the women physicians show a disposition to encourage this view, and single women are frequently subjected to examination and the use of specula without sufficient cause. The sex of the examiner can make no difference in these cases. An examination is an examination, by whomever made, and if it is undesirable it is none the less so because done by a woman.

Examinations through a Speculum.—It frequently becomes necessary to supplement the information gained by a digital examination by ocular inspection of the condition of the vaginal and cervix. The instrument most frequently used for this purpose is the bivalve speculum, a description of which can be found elsewhere.

The Use of Bivalve Specula.—To use a bivalve speculum the patient must be in the dorsal position, as already described, the sheet being wrapped about her limbs as shown in Figure 1. The blades of the instrument are well lubricated and taken in the right hand, being so grasped as to keep their points firmly in contact. The common point of the blades is then applied to the intervulvar crease with its greatest width corresponding in direction with the line of the crease. The labia majora can be slightly pressed apart

with the tips of the blades as they are inserted. Care should be taken to keep the speculum in contact with the posterior vaginal wall and thus avoid striking the vestibule. When the blades have been introduced into the vagina a short distance, a rotation carrying the posterior blade toward the perineum should be begun, and so continued as the instrument is introduced that the greatest width of the blades should be from side to side of the vagina when the instrument reaches the cervix. This simple maneuver keeps the greatest width of the blades in line with the greatest width of the canal as it is passing into it, the vagina being widest in the vertical line at its outlet and in the transverse direction at the cervix.

As the blades of the speculum approach the cervix their points should be made to separate by pressure of the thumb upon the lever. This separation should be so gauged and the direction of the speculum so guided that the cervix is between the points of the blades of the speculum as they move upward. If this is not done one of the blades must push the cervix aside as it is opened, and if the mucous membrane is thin or there is erosion present, considerable injury may result. It is always more or less painful to the woman to have a blade of the speculum dragged across her cervix, and if she has previously been treated by a physician who has not done so, she will suspect the one who does of being awkward or inexperienced.

If the cervix is large, and especially if ulcerated, one of the blades may catch in the external os and much difficulty be experienced in getting the entire cervix between the blades. If the laceration is deep it may be torn deeper in this way.

Where much enlargement of the cervix exists the blades should be so expanded as they enter as to be in close contact with the vaginal walls as they pass upward. This is especially important in cases of epithelioma, as it is desirable to keep the mucous membrane over the cervix entire as long as possible.

After the speculum is fully in place the blades must be separated wide enough to hold it in place and held there by

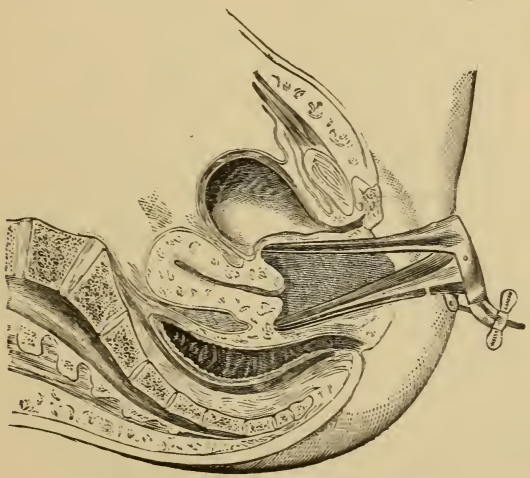

Fig. 12. Bivalve Speculum in Position.

the screw that follows the external lever. In Figure 12 the bivalve speculum is shown in position, with the blades separated.

Sims' Speculum (Fig. 13) has two blades attached at right angles to the ends of a shank. The blades are of different sizes, the smaller or virginal blade being slightly wider than the index finger. The wide blade is used for examining women with large vaginæ and also for operations. This

instrument is so held as to draw the perineum backward and expose the cervix to view. With the patient in Sims' or the genu-pectoral position, it admits the air by opening the vulva and thus permits the pelvic organs to be depressed toward the diaphragm. The manner of introducing Sims' speculum is shown in Figure 14.

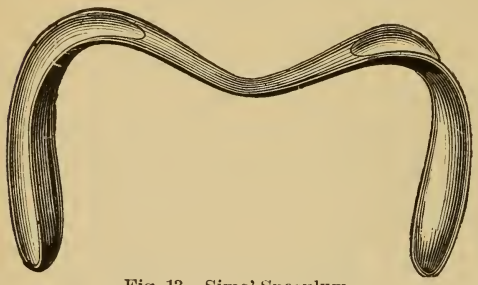

Fig. 13. Sims' Speculum.

A depressor for the anterior vagina is needed with the Sims speculum to enable the operator to get a good view of the cervix and the upper parts of the vagina. Figures 15 and 16 are probably the best forms of depressor in use. Each has its advantages, though Sims' fenestrated instrument (Fig. 15) is the more satisfactory for ordinary use.

Sims' speculum was the instrument devised for the purpose of seeing the cervix with the patient in Sims' position. It

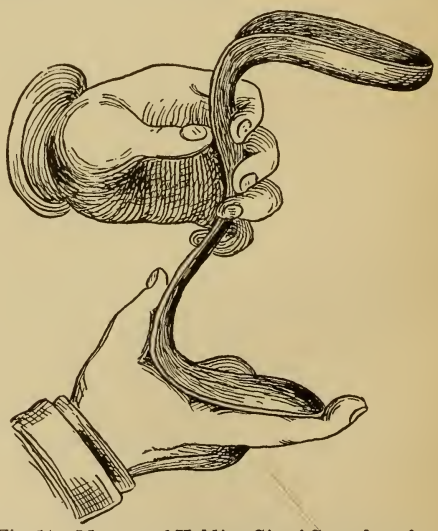

Fig. 14. Manner of Holding Sims' Speculum for Introduction

requires an assistant to hold it in position in cases requiring special manipulation. With some inconvenience the physician may gain a good view of the cervix and hold the speculum himself, but it is very awkward. At the same time it is almost impossible to make applications to the cervix, to pass a sound, or make intra-uterine applications.

Any operation is simply out of the question without a nurse or assistant to hold the speculum. The manner of

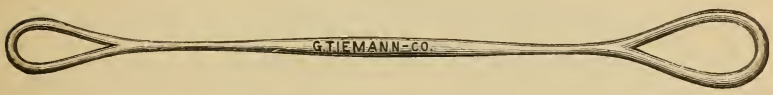

Fig. 15. Sims' Depressor.

holding a Sims speculum is also of considerable importance to the operator. The accompanying cuts will show the different ideas on this subject. The first (Fig. 17) is the method of holding the speculum recommended by Sims, the second (Fig. 18) is a modification of that method advised by Mundé. The main requirements are that the tip of the blade be kept

Fig. 16. Hunter's Depressor.

far back in the hollow of the sacrum behind the cervix; that force enough be made toward the tip of the coccyx to depress the perineal body thoroughly, and that the instrument be held firmly and steadily without change of position. The way in which the assistant grasps the speculum is not of so much importance as the result he obtains in fulfilling these requirements; but it is probably easier for him to do this in the manner recommended by Professor Mundé than in any

other yet suggested. The relative position of patient, physician, and nurse is shown in the illustration (Fig. 19).

The objections to Sims' speculum have already been hinted at in describing the manner of using it. They are chiefly the need of an assistant to hold it in place and the difficulty of doing so. The latter objection is especially forcible in tedious operations. Any one who has tried it does not need to be told how trying an ordeal it is to hold a Sims speculum for even ten or fifteen minutes, and when longer time is needed the difficulty is correspondingly greater. In making simple applications to the cervix or endometrium, or in examinations for diagnostic purposes, an assistant is frequently not conveniently at hand.

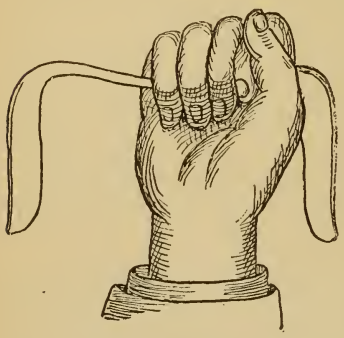

Fig. 17. Sims' Method of Holding Sims' Speculum.

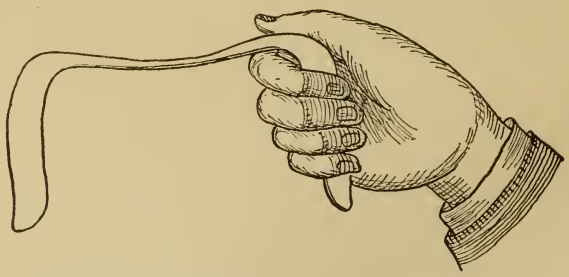

Fig. 18. Method of Holding Sims' Speculum (Mundé).

Self-retaining Specula.—A number of self-retaining specula have been devised, that invented by Dr. Clement Cleveland of New York being most satisfactory. It is

described by the inventor in the following words: "It consists of two Sims blades, each with a flange, and separated

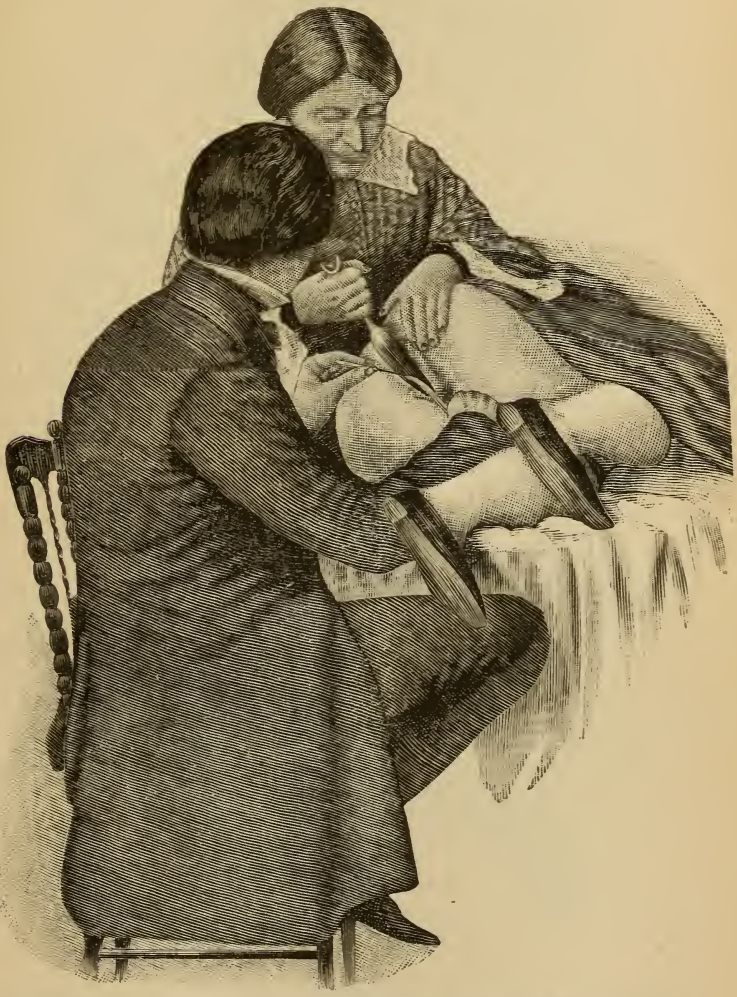

Fig. 19. Relative Positions of Patient, Physician, and Nurse when using Sims' Position. (Sims.)

by an interval of one inch and three fourths (Fig. 20). These, though in parallel planes looking at them from the

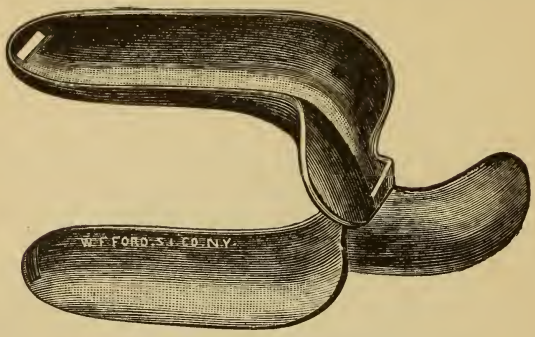

Fig. 20. Cleveland's Speculum.

side, will be seen to be at a slight angle to each other when held with the concavity of either toward the observer (see Fig. 21), the nearer blade deflected to the right and the far-

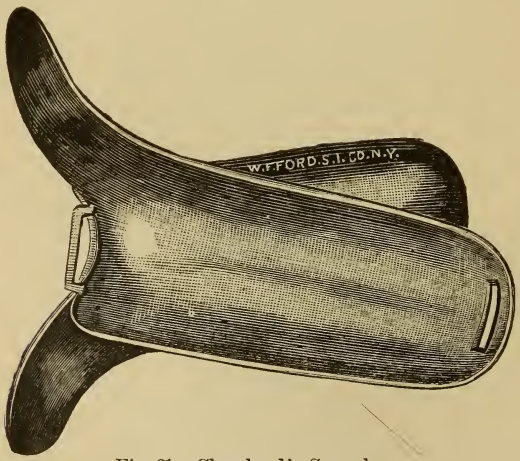

Fig. 21. Cleveland's Speculum.

ther one to the left. At the point of each blade is a fenestra, and at the bend of the instrument, where the two blades

come together, is a narrow metal band. To complete the instrument, there is a belt of webbed material, to be applied about the waist. [This is best worn over one shoulder, to keep it from slipping downward when drawn upon.—C. H. B.] On this is looped, to admit of its being moved readily to any position upon the belt, a piece of the same material. To this is attached a long leather strap with oblong perfo-

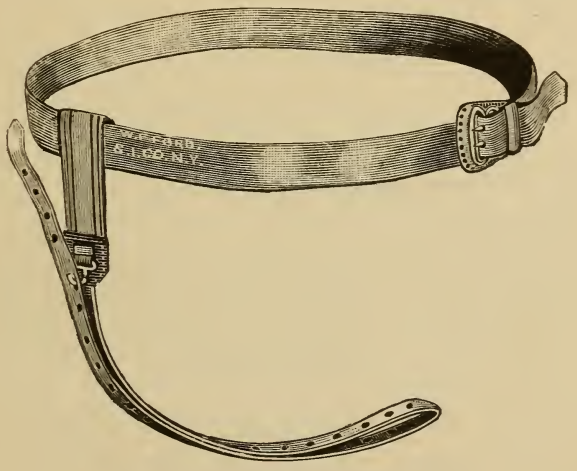

Fig. 22. Belt to Cleveland's Speculum.

rations placed at intervals of half an inch. At the point where this strap and the piece of belting are joined there is a hook (Fig. 22).

"To apply the instrument, the belt is first buckled by the patient, not tightly, about the waist, and outside her clothing, with the attached strap behind and the hook turned outward. She is then placed in the Sims position. The operator selects the blade he thinks best suited to the case, and holding the instrument with the right hand, with the

left he passes the leather strap through the fenestra at the point of the other blade and then under the metal band, leaving the strap quite loose between them. Then, holding the speculum still with the right hand, with the index finger extended along the concavity of the blade, it is introduced, care being taken to pass it back of the cervix. The instrument is then pushed firmly up against the perineum, the outer blade reaching a point just at the bend of the coccyx. In very thin women it may be necessary to place a folded towel under the external blade. The next step is to draw the leather strap tight, first through the fenestrum, and then under the metal band. The perineum is then retracted to the required degree by drawing the strap backward and securing it to the hook provided for the purpose. By now using the vaginal depressor, the cervix is brought at once into view."

The flange holds up the buttock in the same manner as is done by the unemployed hand of the assistant in using Sims' speculum. The fact that the blades are at an angle to each other causes the blade within the vagina to move upward and backward in the same manner as is done by the assistant.

This speculum is simple in its construction and inexpensive, but its main advantage is the absence of joints, hinges, or screws, making it easily kept aseptic.

Figure 23 is a photograph showing Cleveland's speculum in position. I use this instrument in all operations about the cervix and in curetting the interior of the uterus. It is particularly convenient in repairing the lacerated cervix and in doing rapid divulsion for stenosis of the cervical canal. It can be used in making applications to the vagina, the cer-

vix, and intra-uterine, but the bivalve is more frequently used for these purposes. The self-retaining instrument is more applicable to bedside practice. The patient is not required to turn across the bed, as she must to have a bivalve used. She lies on her side and need not hold up her knees to have the Cleveland instrument used. This is a very de-

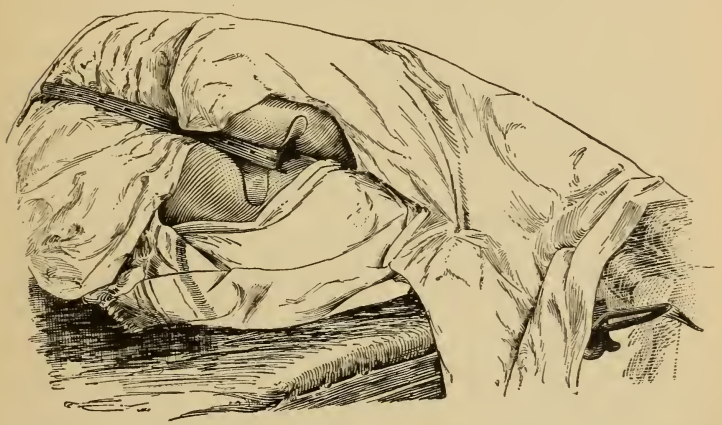

Fig. 23. Cleveland's Speculum in Position. (From photograph, expressly for this work.)

sirable result when the patient is weak, as she frequently is when ill enough to be in bed. The patient in bed is less exposed when treated in the Sims position, because her legs and feet are not required to be moved around in changing her position in the bed. The self-retaining speculum can be used with the patient on either side, consequently it can be used at either side of the bed.

CHAPTER II.

MENSTRUATION.

THE menstrual flow in healthy females begins at puberty and ends with the menopause. There is no interruption in its regular recurrence, except during pregnancy and lactation, that is not due to some pathological cause.

Puberty is the term applied to the changes that occur when the individual passes from childhood to womanhood; she then becomes a perfect being and capable of reproducing her kind. Under normal conditions this is a quiet process, and she suffers no inconvenience from its advent if she is normal and healthy and has suitable environment.

The Signs of Puberty are well known. The whole person expands, the bust enlarges, the breasts become round and full, the hips widen, the voice deepens, hair appears upon the pubes, and the menses appear.

Changes have also been going on within the pelvis that are not evident externally except in their effects. These precede and cause the external changes. The uterus enlarges from an infantile to an adult uterus and rises higher in the pelvis, while the cervix dips more into the vagina, and the ovaries become active and begin their function by the swelling and rupture of a Graafian follicle. The Fallopian tubes are also involved and prepared to perform their

part in the functional activity of the generative apparatus, which is to receive the ovum from the ruptured follicle and carry it to the uterine cavity, whence, unless impregnated, it is expelled. There is also a general congestion and enlargement of pelvic vessels at this time.

The menstrual flow seems to be associated with ovulation and is probably caused by that process, but there is doubt as to when ovulation occurs with relation to the flow. The theory most accepted is that the menstrual flow comes on during the period of enlargement of the Graafian follicle and before its rupture, this rupture occurring at any time from the first day of the flow to a week or longer after its cessation. Observations seem to indicate a considerable variation in the time of the discharge of the ovum in different women.

The Source of the menstrual blood is another point yet *sub judice.* There are observers who claim that it is discharged from the uterine vessels directly into the cavity of that organ. By another theory it is claimed that the uterus sheds its interior lining each month, to be renewed in the following weeks. The newer theories seem to be based on more scientific investigations, and claim that the discharge does not come from the uterus, but has its origin in the Fallopian tubes and travels thence into the uterine cavity.

It is probable that there is a modicum of truth in all of these theories. The origin of the flow seems to be in the tubes or beyond them, and the amount may be small in the beginning, but it receives additions by exudation from the congested walls of the tubes and uterus during its transit

through these canals and by exfoliation of epithelium from the mucous membrane covering them. These contributions received from the canal in transit are evidenced by the fact that detritus from both tubes and uterus is found in the material discharged when it is examined under the microscope.

The interval between the "periods" of healthy women is about twenty-eight days, there being in this, as in all physiological processes, a normal variation due to individual causes and environment.

The Duration of the flow also varies, with an average of about three days, which may, in individual cases, be reduced to two or increased to five. A flow of less than two or more than five days is usually from pathological cause, and should receive investigation as to its import and causation. The quantity of the discharge is also subject to a normal variation. It is best estimated by the number of napkins worn per day, the usual number being from one to four or five. Some perfectly healthy women may soil several more than five in one of the days of the flow, but if this number is required during more than one day, the flow is excessive and has a cause which needs investigation. The length of time the napkins are worn differs with the habits of the woman. One will wear a napkin until it is saturated with blood, while another will reject one which is only slightly stained; hence these differences must be considered in estimating the amount of the flow by the number of napkins worn during a period. The quantity of blood expelled in clots must also be known in estimating the total loss at a period.

The Age of the inauguration of the menses depends to

a considerable degree on the environment, particularly the climate and social conditions. There is a difference in races also which is probably an inherited result of the climate and social customs to which their ancestors became habituated.

The age of puberty varies from the tenth to the sixteenth year, the former being common in tropical countries and the latter in colder climates. In temperate climates the age is between the twelfth and the fifteenth year. These limits are rarely deviated from, except in children of parents from a different climate. Cases are on record of menstruation in the second and fourth year, but such cases are abnormalities and of rare occurrence. The flow may also be absent to the twentieth year or longer, but there is usually lack of development or wasting disease when such is the case.

When the woman is in perfect health and has normal surroundings in all respects she suffers no inconvenience from menstruating. The flow is perfectly painless from inception to cessation; she does not know of its presence until the blood appears externally, and only knows it has ceased by ceasing to have the discharge. Like all purely physiological processes when performed under perfectly normal conditions, it is without sensation. When the number of civilized women who do have sensations of their menstruating is noted, the extent of their deviation from the normal is realized. A woman with perfectly physiological menstruation is rarely found. The average woman has pain at least for an hour or two, or she feels "dragged out" and "good-for-nothing" for at least one day in each month, or has some other abnormal sensations at this time causing her to feel not so well as at other times.

These deviations from the normal are partially inherited in the form of misplaced or poorly developed organs and impaired general health, and are partially acquired from faulty environment, unhygienic clothing, and unwholesome habits of life.

It is needless to more than mention the evil results due to the manner in which civilized women are dressed. The habit of supporting all the clothing for the lower portion of the body by fastening it around the waist is of itself sufficient to cause uterine deviations, pelvic congestion, and constipation. But the unhygienic dressing of women is too well known to call for discussion here, mention of the fact being sufficient to show that it is an important factor in the production of menstrual abnormalities.

The habits of many civilized women are also in utter disregard of consideration for themselves. Young girls will go out at night and dance for hours when they are menstruating, subjecting themselves to dangers from overheating, too much laborious exercise, and loss of sleep. These things are particularly injurious at the time these functions are being called into play for the first time. The dancing is of itself a healthful amusement, but its excess and indulgence in it at improper times injures many young women.

Menstrual Abnormalities.—It has been customary to devote considerable space to the consideration of the various abnormalities of the menstrual flow. This custom has been so general, in fact, that a book on gynecology would seem incomplete without it. In following this general custom it is necessary to emphasize the statement that these various deviations from the normal function are not in themselves

diseases, but are only symptoms of disease. In the early days of this branch of medicinal science amenorrhœa, dysmenorrhœa, leucorrhœa, and a number of other conditions were considered to be disease entities. But as knowledge has grown more exact and observation and investigation have assumed a more scientific basis, they have been relegated to the category of symptoms, many of them being due at various times to very different causes.

Amenorrhœa, or absence of the menstrual flow, is a condition resulting from so many different causes that a chapter will be devoted to its consideration. Scanty menstruation is a condition due in many cases to the same causes that eventually produce amenorrhœa, but from the importance of the measures to be employed for its relief, a special chapter is more convenient for its proper description. The excessive loss of blood from the uterus will also be considered alone. All of these variations from normal in the amount of the menstrual flow will be mentioned through the succeeding pages as symptoms of the other conditions therein treated of. The reason for devoting separate space to these symptoms is that their importance at times outranks that of the condition causing them in the danger or suffering they give the patient. Or to be more exact, the symptom is of itself the important thing to the patient, and it is for relief of this symptom that advice is sought. Oftentimes the causes are obscure or of neurotic origin. This of course is not a legitimate excuse for failing to find the cause; but it may be necessary to relieve the symptoms before time can be given to sufficiently investigate the case to learn what produces them.

Dysmenorrhœa is a symptom so frequently the cause for which young women seek advice that a few words concerning it will not be amiss. The term is applied to pain occurring at or within a day or two either before or after the menstrual flow. It has been classified in various ways, the best division being into "ovarian tubal" and "uterine"; the first variety being in the appendages and supposed to occur during the ripening of the Graafian follicles, the second being in the uterus during the expulsion of the menstrual blood.

Varieties.—In the first class of cases the pain is usually during the first day of the period and not unfrequently for a number of hours before the flow begins. It is higher in the pelvis and more of a neuralgic character than the uterine pain, and is usually continuous. The pain of uterine dysmenorrhœa is also at times a few hours before the commencement of the flow, but it is periodic in its intensity, resembling labor pains, and is usually followed by the expulsion of a blood clot with relief from the pain. The cessation of pain after the passage of the first clot of blood may be for the rest of that period, the remaining days being passed in comparative comfort, or it may be followed in a few hours by a new attack of "cramps" followed by the expulsion of another clot of blood, and so continue until the flow ceases. This form of pain has also been called obstructive dysmenorrhœa. It is due to two different causes.

Causes.—The most frequent cause of uterine dysmenorrhœa is stenosis of the cervical canal, the narrow orifice forming an obstruction to the passage of the blood from the cavity of the uterus. The blood accumulates until it, by its presence,

causes the uterine muscle to contract upon it with sufficient force to expel it. This contraction of the uterus is of the same character as labor pains; it also resembles them in being paroxysmal and expulsive. Dysmenorrhœa due to swelling of the mucous membrane lining the interior of the uterus is also obstructive in character. The internal os is practically closed by this thickened mucous membrane, and the contractions of the muscles forming the uterus are necessary to overcome the obstruction.

Another cause of uterine dysmenorrhœa is the presence of an unyielding point in the uterine wall. When the organ becomes enlarged as a result of the congestion due to the increased amount of blood in its walls, pain is caused by the resistance the inelastic point offers to the swelling. This condition is usually found with congenital deviation, a condition often present with stenosis. Consequently this form of dysmenorrhœa is frequently found with the obstructive form.

Dysmenorrhœa is often due to irritation of the nerve end-plates located in the walls of the uterus. Pressure due to the increased quantity of blood in the uterine vessels acts as a mechanical irritant to these nerve filaments, producing pains of a neuralgic character. The pains frequently present with scanty or delayed menstruation are of this character.

An examination of the pelvis is not always to be had, and in some cases an effort to relieve the symptom may be justifiable before it is advised. But it must always be borne in mind that dysmenorrhœa is a symptom, and an effort should be made to learn its cause. When examined the cause will usually be apparent, placing the case at once in its proper category. If there is uterine congestion it will be discov-

ered; if stenosis or other cause of obstruction, that will be found; if due to ovarian-tubal disease, the tenderness at the sides of the uterus and the enlarged appendages will demonstrate the fact. None of these conditions need further mention here, as each will receive attention at the proper time. After all these are eliminated a number of obscure cases will remain which are recognized as not belonging to any of them. The examining finger may find absolutely nothing to account for the pain; but usually a certain amount of tenderness is present, and leucorrhœa is commonly found. In these cases nothing more is found except some general symptoms, such as cold extremities, sluggish circulation, and digestive disturbances.

Treatment.—In these cases tonics, especially nerve tonics, as nux vomica, are beneficial. The low-pressure douche of warm water to the spine is used at Strathpeffer Spa with good effect. To use this remedy the patient sits in a comfortable position, and the temperature of the water is from 100° to 105° F. as is most agreeable to the patient.

Hot vaginal douches, especially when taken a few days before the expected menses, will often relieve the pain and cause a painless period to result.

Electricity cures a number of these cases of dysmenorrhœa. The faradic current is used, one pole being applied over the lumbar region behind, and the other pole across the lower abdomen just above the pubes. The remedy should be applied with the patient either sitting or reclining in a comfortable position. The strength of the current should be governed by the feelings of the patient, and should be a little less than is painful.

The dysmenorrhœa of non-parous married women is frequently relieved by galvanism. The negative pole is applied intra-cervical or intra-uterine. When the cervix will not freely admit the electrode it can often be introduced by turning on the current and allowing it to pass by applying a little force as it enters the cervix. The current must be mild, not strong enough to produce pain.

The treatment of dysmenorrhœa of ovarian-tubal type is not so satisfactory. If due to ovarian congestion or ovaritis the treatment for those conditions is indicated. When due to salpingitis the treatment of those organs is to be followed. Electricity, either galvanic or faradic, may be tried, and vaginal douches (not above 110° F. if the ovaries are diseased) will add to the patient's comfort. Opiates or alcohol in any form should never be used.

Uterine Neuroses.—The subject of menstruation cannot be dismissed without some mention of uterine neuroses, and especially of their effects on the condition of the skin. Mention of the effects of reflexes from the uterus to the head and alimentary canal has already been made. The production of neuralgia, asthma, cough, hysteria, and loss of muscular control from uterine cause has also been considered. The uterine reflexes cause marked variations from the normal in the skin. The form taken is usually that of some eruption on the skin surface. Mistakes in diagnosis are common, the true cause of the skin lesion being overlooked.

Probably the most common form of reflex pelvic eruption is chloasma, and it is also the form most frequently attributed to other causes. These uterine chloasmata are usu-

ally supposed to result from liver disturbances. The feature about these "liver spots" is the fact that they change in size and distinctness as the uterine disease gets better or worse, showing their uterine causation.

Many of these reflex eruptions are only seen at or just before the commencement of the menstrual flow. I have seen them take the form of burns, appearing on various parts of the body and gradually fading away. One case had these lesions from five past menstruations in various stages, from the fresh spots exactly like a deep burn that had been made with a low degree of heat to marks that could be seen as a very faint discoloration of the skin.

Another case had an eruption resembling herpes covering the entire body from the feet to the head. The eruption came a day or two before the period and faded away within twenty-four hours after the flow began. Her pelvis was examined and found normal, and she complained of no discomfort. She was a widow and had had children.

Another case had a typical scarlatina eruption covering the whole body, and only lasting a few days at the beginning of each menses.

Frequently skin neuroses develop after castration. They usually occur about the time the period should have come, and remaining for a few days, fade away. They take any of the forms described, or may resemble bruises and take several months to disappear.

The treatment of the pelvic lesion will usually cure the skin involvement. When there is no appreciable disease in the pelvis bromide of sodium will frequently be of benefit. Tonics for the nervous system should be used; nux vomica,

arsenic, and phosphorus are good. Iron and stomachics can also be used.

The chief importance of these skin lesions of reflex origin is in knowing their causes and import.

Vicarious Menstruation is not a common abnormality, but it is occasionally met with. There is a loss of blood at some other point, and none from the uterus. In a typical case this discharge of blood recurs at regular intervals about four weeks apart. The blood expelled frequently has the peculiar odor so characteristic of menstrual blood. The amount lost varies just as the amount of the menstrual flow may vary in individuals.

The vicarious discharge usually occurs from some surface covered with mucous membrane, although cases are seen when it comes through the skin. The most frequent place is the mucous membrane of the nose. The girl will have a hemorrhage from the nose about once a month. These cases are most common in girls who have never menstruated. Instead of the normal flow from the uterus the nose bleeds. In other cases the mucous membrane of the stomach is the site of the vicarious bleeding. The blood may be digested and pass on into the bowel. The only symptoms will be a certain amount of nausea and loss of appetite, followed in a day or more by a copious stool of digested blood. The blood may cause vomiting and the patient and her friends be greatly frightened at the "hemorrhage." Cases of this kind have been treated as ulcer of the stomach. The regular periodic recurrence will aid in establishing the diagnosis.

The flow may be from the mucous membrane of the alimentary canal below the stomach. When this occurs the

blood will be expelled per rectum in a more or less digested condition, depending on the distance of its origin from the anus. If it come from the colon or rectum the blood will appear externally as a hemorrhage. A discharge of blood from the rectum has been mistaken for a normal menstruation by inexperienced patients. Ulcers of the bowels or cancer in the rectum may cause a discharge of blood per anum, but the bleeding from either of these conditions is irregular in the time of its occurrence. The vicarious discharge is generally regular in its recurrence.

Bleeding from the skin is not so common as from some mucous surface. I have seen two cases. In one the flow was from a small opening over the left pectoralis major muscle. The point of exit was about three inches above the left nipple. A small silver probe could be passed in two inches. There was no other abnormality about the chest. The development of the mammary glands was the same on either side. The amount of blood discharged each month was small.

The other case of menstruation from the skin was from the surface of an ulcer. This ulcer gave off a bloody discharge every month. It was of limited amount, and when the sore healed and ceased to discharge the normal menstrual flow returned.

The importance of these abnormal discharges is that they may be recognized and not be mistaken for some other condition. They are usually a symptom of some disease or malformation of the genital organs, and an investigation of those organs should follow the discovery of vicarious menstruation.

CHAPTER III.

AMENORRHŒA.

AMENORRHŒA is the name given to the complete absence of menstrual flow. It may be that the ovarian function has never begun, in which case it is called primitive amenorrhœa. When the menses have appeared and then cease the condition is spoken of as an acquired amenorrhœa. It will be most convenient to describe each one separately.

Primitive Amenorrhœa is, at times, a result of late development. The girl is not strong and the menses do not appear. She may go on until she is seventeen, eighteen, or even twenty years old before she matures. In these cases some impaired condition of the health is the usual cause. The diseases causing amenorrhœa are the so-called wasting diseases:—consumption or general tuberculosis, richitis, epilepsy, chlorosis, and the various other forms of anæmia. When the condition is due to any of the above causes the ovaries are usually normal and consequently capable of performing their function. The girl does not mature because of the impaired condition of her general health, not because of any fault in her genital system.

Causes of primitive amenorrhœa may exist in the genital canal. These may be of two kinds. First, it may be due to absence of development of the ovaries, making it impos-

sible to have their function performed. The ovaries may be infantile, when they are very small, or they may be rudimentary, existing only as a small mass devoid of true ovarian tissue. In some cases the organs may be entirely wanting.

Amenorrhœa because of Impaired Development.—When there is rudimentary or absent ovaries treatment is of no avail. The condition is not very common. In these cases frequently no symptoms are present beyond the amenorrhœa. The girl grows up as other girls do and may seem in perfect health, but the menstrual flow fails to appear. She may have normal external genital organs with a vagina, uterus, and Fallopian tubes, or any or all of these organs may be wanting. If the vagina is present and patulous she may marry and have the marriage consummated, but of course cannot bear children. The sterility often is the cause of her seeking the advice which leads to a discovery of her condition. If the advice is sought before marriage she or some member of her family should be informed of the want of functional completeness and its consequences.

Amenorrhœa from Atresia.—The ovaries may be normal and their development may go on to maturity, but the menstrual flow fail to appear. This is due to a mechanical interference with the exit of the discharge. The case is then one of retained menstruation. The symptoms and treatment will be considered in chapters on atresia of the vagina and cervix. The usual point of closure of the canal is at the outlet of the vagina, the barrier being an imperforate hymen.

The cases in which the ovaries are present and capable of performing their function are of more importance. At

times, in these cases also symptoms are entirely wanting, with the single exception of the absent development. The patient may suffer no inconvenience whatever, and only the fears of her friends may cause her to consult a physician. It is a popular idea that the absence of the menses causes consumption, this fallacy evidently coming from the fact that the flow is usually absent during the last months of this disease.

The Symptoms of primitive amenorrhœa are generally those of the disease causing the impaired nutrition. The tuberculosis will be evidenced by the pale skin with the afternoon flushing of the cheeks, the scanty amount of flesh, the night-sweats and general weakness, and, if the disease be in the lungs, cough, expectoration, and the physical signs of phthisis pulmonis will also be present. The cases with consumption, however, are more apt to be suspended menstruation, as puberty usually has arrived before the disease has made sufficient progress to interfere with the development. These cases require the treatment for the tubercular condition, the amenorrhœa being a result needing no special consideration of itself. The question of diagnosis is the only one of importance here.

Anæmia is a more frequent cause of amenorrhœa, and especially of primitive amenorrhœa or late menstruation. The other symptoms of anæmia make a characteristic picture. There is want of color in the skin, lips, and sclerotics, the chalky whiteness of the latter being the most constant. The patient may be poorly nourished, but more frequently she inclines to stoutness with dyspnœa on exertion and weakness, and there is often an anæmic bruit

found over the base of the heart and in the carotid arteries.

These cases of anæmia are usually constipated, the condition of the bowel being in many cases the cause of the blood impairment. The ill effects to the blood due to the reabsorption of excrementitious elements from masses of fecal matter allowed to remain in the colon and rectum are evident to every one who has heard of "fecal anæmia," and the amenorrhœa is a more remote sequence in the same chain of vicious results from a simple neglect.

Menstruation is at times delayed in girls who seem perfectly well, until they are seventeen or eighteen years of age, no cause being apparent. They are not anæmic nor afflicted with any wasting disease, and are frequently robust, with abundant color and excellent appetite and digestion. The only symptom aside from the absence of the menstrual flow is a tendency to eat pickles and other indigestible kinds of food, and an inclination to do unconventional things; these are the outcome of a certain amount of irritation caused by the nervous reflexes.

The question of examination in cases of primitive amenorrhœa depends on the symptoms.

Examination.—Evidences of *molimina menstruale* must be inquired for, and if she has pains in the back and loins and heaviness in the pelvis which is worse on standing, and especially if she has dysuria recurring each month with the above symptoms, an examination for imperforate hymen is essential. A simple inspection of the external genitalia made by separating the labia majora will decide this question. If the hymen is perforated and suppressed menstrua-

tion is still suspected, a straight sound can be inserted through the opening into the vagina, and passed upward to ascertain if atresia exists there. As examination with the finger will cause considerable pain if attempted through the opening in the hymen, rectal examination can be made and the size and condition of the uterus investigated; if it is enlarged and filled with retained menstrual blood, it can easily be made out, and the proper measures for its relief will naturally follow.

Usually the inspection of the hymen and the probe in the vagina will be sufficient to reveal the condition of these parts; at the same time the infantile external organs will be noted, the narrow thin labia, the short perineum, the short vagina, and narrowness of the vulvar slit are all apparent. Examination of the chest will allow the undeveloped condition of the breasts to be discovered. These patients are usually small, thin of flesh, shy, anæmic, with poor appetite and intervals of abnormal desire for food.

When there is no evidence of the menstrual molimen in amenorrhœa due to anæmia, the physical development is frequently complete, but, because of the impaired condition of the blood, the flow does not appear. This is also the case with the robust non-anæmic cases, the failure of the organism to start the period being due to some impaired element in the nervous system.

In cases belonging to any of the above classes inspection of the hymen and vagina with auscultation and percussion of the heart and lungs is all the examination indicated, the diagnosis being made almost entirely from the general symptoms.

Treatment.—The treatment of anæmia will be given later during the consideration of acquired amenorrhœa. Consideration of those cases of primitive amenorrhœa due to want of development and those due to impaired nerve force remains, the one being puny, poorly nourished, and timid, the other larger, better nourished, but erratic.

For the first of these the hygienic treatment is of importance. She must not study or read too much, as she is frequently inclined to do; nor must she be allowed to use up all her energy in physical work or her play. She is apt to be too intense in everything, taking the world too much in earnest, and feeling her disappointments with greater earnestness than the average child. Above all things she must not be told the object of her treatment, as it will only give her an additional cause for morbid worry.

She needs plenty of mild exercise in the open air, cheerful surroundings, and the companionship but not the care of young children. She must be kept from society, late hours, and excitement. Light warm clothing is important, and daily baths followed by brisk rubbing until the skin glows will help her. Massage and sea bathing are frequently of benefit. The dietary must be plain but good, with no sweetmeats or pastry, but a plentiful supply of nourishing, easily assimilated food. The condition of the alimentary canal must be watched, and the appetite encouraged by bitter tonics with laxatives when indicated. Gentian, strychnia, and quinine with aloes are excellent remedies for these patients.

Douches over the spine or shower-baths can be tried, and if well borne continued. Electricity may be given, in tonic doses, through the general system, the faradic current being

used for this purpose; its action directly to the pelvic organs is not so frequently indicated.

Drugs to act directly on the amenorrhœa must not be neglected, though they rank second in importance in the treatment. The most efficient of all is probably iron, which can be given in the form of the tincture of the chloride with glycerine and strychnine, when the action of these bitters directly on the stomach is of benefit. It must be well diluted in water before taking, and the teeth must be guarded from its action. Better results will probably be obtained from the use of Bland's pill in large doses, as will be described under anæmia, the other drugs being given in a separate mixture. The permanganate of potassium and the binoxide of manganese are both good tonics, and a specific action in causing the menstrual flow is claimed for both. Amenorrhœa is frequently cured by them.

Belladonna with strychnine and aloes has cured amenorrhœa in the more robust cases where the cause is evidently in the nervous system. Bromide of sodium is beneficial in these cases. If pain is a symptom, acetanelid will act as a sedative and by its action on the circulation will relieve the congestion as well; a small dose of the sulphate of quinine is an aid to the action of this drug. My favorite formula is:

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Acetanelid..... ʒ j
Quin. sulphat..... gr. x

M. Ft. in capsula No. x. Sig. One capsule every two hours when needed.

These capsules are especially efficient when much pain is present.

When the hygienic and medicinal treatment fails to relieve the amenorrhœa, local treatment may be required, especially if marriage is contemplated in the near future. Electricity can be used for this purpose. The faradic current is passed through the ovarian region by placing an electrode on the back and the other first in one inguinal region for five or ten minutes and then in the other for a like period. If a more immediate action on the ovaries is desired, one electrode can be applied within the vagina, either at the cervix or in the lateral fornix nearest the ovary being treated, while the external electrode is applied over the corresponding ovarian region on the lower abdomen. If it is desired to get the effects even nearer to the ovary, the internal electrode can be introduced within the uterus. These applications can be made every second or third day and their use continued for a number of weeks.

If the faradism fails the method recommended by Apostoli can be used. He uses the galvanic current, and taking advantage of its chemical action in producing hemorrhage, places the negative pole within the uterus, the positive pole being applied over the ovary by means of a sponge or clay electrode. The flow once started in this way is apt to recur at regular intervals and a cure result.

Another method of applying electricity is by means of an intra-uterine stem composed of zinc and copper arranged either in parallel layers or as a series of beads in which the metals alternate. A battery is formed as a result of the chemical action of the secretions upon the zinc. The amount of electricity generated in this way must be small, and it is doubtful if it has much effect upon the amenorrhœa, the

benefit obtained from wearing these electric stems being largely due to the presence of a foreign body in the uterus.

This stimulation to the functional activity of the uterus can also be obtained by the frequent passage of a large sound into the uterus. Where there is much congestion of the uterus and the flow does not begin simply because the habit has not been formed, the frequent introduction of as large a sound as can be passed without pain is stimulation enough to start the flow in a few weeks.

If the congestion is very great and fails to be relieved by the sound or electricity, a leech may be applied to the cervix and allowed to remove enough blood to soil a half-dozen napkins, or the cervix may be punctured with a lancet and allowed to relieve the congestion by bleeding. These methods are more frequently indicated for scanty menstruation and are fully described in the chapter on that subject.

Acquired Amenorrhœa differs from the primitive form in the respect that the menstrual flow has begun and existed for one or more periods before the amenorrhœa began.

Causes.—The most common causes have already been mentioned, being consumption in its later stages, anæmia and chlorosis, and the wasting diseases in general. Occasional causes are colds, fright, and violent exercise at or just prior to the time for the period. The physiological cause of amenorrhœa, pregnancy, must also be thought of and mistakes guarded against. It is also claimed that diabetes will produce amenorrhœa, with atrophy of the uterus and ovaries. Change of climate is another frequent cause, girls coming from Europe being frequently without their menses for a number of months after their arrival. It is not known if

the amenorrhœa is a result of the ocean voyage, the change in the manner of living, or the difference of climate, but the menses will return in the majority of cases without interference. It is well, however, to give them treatment for the alimentary canal, if needed, with iron if anæmia is present.

Amenorrhœa may occur in very young girls who menstruate one or more times and then the flow ceases. This condition rarely calls for any treatment except attention to hygienic surroundings and possibly tonics, such as nux vomica, iron, or quinine. The flow will usually return in a few months without the patient having suffered any disadvantage from its absence.

Amenorrhœa from Wasting Diseases, as consumption, diabetes, chlorosis, or cancer, is almost always acquired, and is due to the conservative action of the organism in suspending the loss of blood when it is already too much depleted to spare it. The amenorrhœa is only a symptom of the disease, and its treatment requires no consideration aside from the regular treatment of the causing disease.

When the flow stops suddenly during the course of a wasting disease, it is well to examine for possible pregnancy if the woman be married. This is more liable to be the case in patients who have phthisis, as they seem especially prone to conceive in the early stages of this disease. Women who have diabetes or chlorosis are more apt to be sterile.

Amenorrhœa from Pregnancy will probably test the ingenuity of the physician more than any other class of cases he will meet. The patient usually comes to him reluctantly, and if she does come of her own volition it is with hope that her fears will not be verified. These circumstances will

make her information unreliable or misleading, and if bent on concealment she may be positively untruthful. Where pregnancy is suspected the physician must exercise every power of observation he may be possessed of. The girl who fears she is pregnant will act differently from the one who has nothing to fear from the most searching investigation. The questions can often be so put as to prevent her from suspecting their import. Discussion as to the condition of the appetite and digestion will naturally lead up to the inquiry for nausea; the time of day at which it occurs can usually be learned without special stress being put on the matter, and it can finally be learned if she has morning nausea or vomiting. After learning all about the condition of the stomach, inquiries concerning the condition of the bowels will naturally follow. It can then be learned if there is frequent micturition since the amenorrhœa began, and also if there has been increased leucorrhœa during the same period of time.

Examination for pregnancy must take into consideration the breasts and external genitalia as well as the condition of the uterus. It is probably best to begin with the pelvic organs.

The Vulva will be first inspected, and the size and color of the labia and introitus carefully noted. If pregnancy is present the dark-blue or deep-red color of these parts and the interior of the vagina will usually be found. This change in color of the external genitalia is a valuable sign of pregnancy, as it is so frequently present. It usually appears very early, at the time when positive symptoms are difficult to find. It may be only a slight reddening of

the parts at first, which gradually deepens in color until it reaches a blue veinous tinge about the fifth month. It is seen early in the second month and is almost diagnostic when present, the only other conditions producing it being neoplasms of the uterus, and these cause menorrhagia rather than amenorrhœa. The absence of discoloration of the labia is not evidence that pregnancy does not exist, but its presence is almost positive evidence of its existence. Enlargement of the labia is another result of pregnancy, which is somewhat later in appearing in a sufficient degree to be diagnostic.

The Hymen.—The condition of the hymen will be apparent when the labia are separated; the presence of this membrane intact is by no means positive evidence that pregnancy does not exist, as it is possible for spermatazoa left on the vulva to find their way into the vagina and uterus, causing conception. The hymen is also at times elastic enough to admit the examining finger without tearing. I saw one hymen so rigid that it could not be ruptured by any justifiable amount of force with the examining finger, and coitus had been attempted a number of times but never accomplished, yet the woman had a gonorrhœal vaginitis. The presence of the hymen in this case was no evidence of chastity.

The absence of a membrane more or less completely closing the vagina is not positive evidence that coitus has been performed, and consequently is of little importance as an evidence of possible pregnancy. The membrane may become broken in a number of innocent ways, or it may have been of limited extent in the first place. In the latter case, however, a rudimentary hymen will be found surrounding

the entrance to the vagina. The carunculæ myrtiformes were formerly thought to be remains of the hymen. Coe claims that such is not the case, but that these small bodies around the introitus are caused by the rolling up of small particles of the vaginal mucous membrane carried down by the fetal head in delivery. If this theory is correct their presence is positive evidence that the woman has borne children. My experience shows that they are usually present in women who have borne children, but I cannot recall a single nullipara, married or single, in whom I have seen them. They are not likely to be found in a young woman with amenorrhœa in whom pregnancy is suspected.

The Uterus.—The examination of the uterus naturally follows inspection of the external parts, and should be made in the manner already described. The finger will ascertain the condition of the vagina as it is introduced. The cervix is the first point of importance reached. Its size and consistency are both of importance, especially the latter. The cervix of the pregnant uterus begins to soften around the external os in a few weeks after conception takes place. In the earliest weeks this soft velvety feeling will be confined to a very small zone immediately around the external os, which gradually enlarges as the pregnancy advances, until the whole cervix feels soft and pliable to the touch, communicating an impression to the examining finger in marked contrast to the hard resistant cervix found in non-pregnant women who have amenorrhœa. This is a symptom rarely present in any condition but pregnancy, and is one of the signs most depended on in making a diagnosis.

The size of the cervix also gradually increases as preg-

nancy advances, but this does not occur so early as to be of much importance in the class of cases under consideration. Its chief importance is that it should be remembered, the opposite condition of infantile os, long and very small, being a sign of the probable absence of the pregnant condition.

Hegar's Sign of Pregnancy.—As the finger passes up at the side of the cervix, learning the size, direction, and consistency of that part around the internal os and of the fundus, the most important symptom to be sought is what is called Hegar's sign of pregnancy. When pregnancy occurs, among its earliest effects is a marked softening of the lower segment of the body of the uterus in a zone just above the internal os. This softening is at times so complete that no impression of resistance is conveyed to the examining finger at all. A number of cases are recorded by Sonntag (who recently published an article on the results of examining for this sign in a vast number of pregnant women in the maternity hospital at Berlin) in whom pregnancy was mistaken for a tumor, and in one the abdomen was opened for its removal before the true condition was discovered. In this case the softening of the middle uterine segment was so complete that no connection could be made out between the fundus and the cervix; the latter was enlarged, and its upper part was supposed to be the fundus in extreme retroflexion, the fundus giving the impression of a mass in the pelvis separate from the cervix.

Such extreme softening is not frequent, but a considerable degree of it can be made out in almost all cases of pregnancy. The exceptions are usually due to the presence of unyielding tissue from stenosis or anteflexion. The impor-

tance of Hegar's sign is the early period in the gestation at which it can be made out, it being found usually at the end of the fifth or sixth week. The only other condition that gives this symptom is "mollites uteri," and it can be distinguished by having the patient change to the Sims or genu-pectoral position, when the position of the uterus will change. Then mollites is never associated with the darkened labia and vaginal mucous membrane, and rarely with disturbance of the stomach.

The Size of the uterus will also be ascertained in examining for the other symptoms mentioned, a considerable amount of enlargement being present at the second month. Increase in the size of the uterus is not diagnostic of pregnancy, but, with other symptoms, it helps to complete the chain of evidence which leads the physician to decide as to the condition present. It is well to remember that other causes may produce uterine enlargement.

The Breasts.—The condition of the breasts must be learned when pregnancy is suspected. After the pelvic examination has been made little difficulty will be experienced in securing an examination of them. The darker color of the areola around the nipple is significant, and more so when the papillæ are enlarged. The size and erectility of the nipple are also increased. The ability to express fluid from the breast has much importance attached to it by some authorities, but this can be done with some non-pregnant women, and it is not diagnostic of the early stages of pregnancy. It may, however, have an influence on the patient herself and induce her to confess her indiscretion when she sees the "milk" come from the nipple.

The signs and symptoms of pregnancy should be well known to every practitioner, and the greatest care must be exercised to exclude all possibility of its existence before an attempt is made to pass a sound or probe into the uterus. Women who are pregnant go to a physician hoping that if they deceive him as to their condition he may do something to cause them to abort.

It is well in most cases not to be too positive in giving a diagnosis of pregnancy, especially where the girl maintains her innocence; an expression of opinion may be made, but the possibility of an error should be remembered.

Anæmia.—Probably the most important cause of acquired amenorrhœa is anæmia; the menses may have been present only a few times or they may have been regular for a year or more. With these patients the onset is a gradual one, the beginning symptoms being slight; they first suffer from digestive disturbances, and are almost always constipated. These symptoms are followed by shortness of breath on exertion, oppression over the heart, tired feelings, loss of appetite, and loss of color. This condition may exist for a number of months before the menses stop, and if she does not fear she has "heart disease" and seeks advice for that, the patient may not go to a physician until the amenorrhœa sets in. Then she will come for something to bring back her "courses," fearing their absence will cause consumption.

When *examined* she will be found to have a marbly whiteness of skin, blanched lips, and chalk-like whiteness of the sclerotics. She is frequently stout, but may be poorly nourished. The tongue is large and moist and may be coated white. The lungs are normal and the heart action is

normal, but a murmur is frequently heard over the base of the heart, the sounds being transmitted upward along the carotids. Examination of the genital organs is rarely indicated, the diagnosis being apparent from the general symptoms.

The Treatment of the anæmia consists in removing all its causes and replenishing the depleted blood. The constipation must be relieved first of all, and probably the most difficult task in the treatment will be for this part of the disease. Cathartics of various kinds will be tried and may give relief for a time, but the patient soon tires of them and neglects to take them regularly. It is absolutely necessary for these girls to have a thorough evacuation of the bowels at least once daily. Another difficulty encountered is their inclination to conceal their true condition in this respect. Ask any number of women the condition of their bowels, and in a majority of the cases the answer will be, "Oh, they are all right;" yet further questioning will prove that they defecate but two or three times a week, or even less frequently. Unless impressed with its importance by their physician, this tendency to conceal the constipation present will be greater after they have been taking cathartics for a time. Many drugs are recommended highly for this purpose, and its attainment is attempted by other means without drugs. In order to succeed with either it must be remembered that it is a habit that is being combated, and that it is necessary to remove the bad habit and at the same time replace it with a good one.

The constipation habit is not cured in a few weeks but months, and at times years of daily attention are required to

thoroughly eradicate it. Drugs for constipation should be such as can be used for a long time without injury, and as a consequence mercurials are only allowable for relief of an immediate condition and not for continuous use. When a speedy evacuation is required with as little disturbance as possible, it can be had by giving calomel in doses of one tenth of a grain every two or three hours until it responds freely. This can be repeated daily for a week or two, but not longer, and should always be followed by some non-mercurial laxative.

Cascara segrada is probably the most satisfactory of all cathartics, and its use does not, as a rule, call for increasing dose with time, as many others do. It can be used alone or in combination in the form of the fluid extract, or the cordial may be taken alone. The latter preparation is not unpalatable, and a teaspoonful at bedtime usually causes a movement from the bowels in the morning without griping or other discomfort. The fluid extract combined with the official mistura rhei et sodii and powdered ipecac is very efficient, the appetite frequently being increased by its use. If indicated, tincture of nux vomica can be added to the above. A satisfactory formula is as follows:

℞

Pulv. ipecac.....gr. vj
Tinc. nucis vomicæ.....ʒ iij
Ext. cascar. fluidi.....ʒ iij—ʒ v
Mist. rhei et sodii.....q. s. ad ℥ vj

M. Sig. ʒ ij before each meal in a half-tumbler of water.

Enemata high enough to flush the entire colon have recently been recommended for the cure of constipation,

two or three quarts of water being used for this purpose. When first attempted the muscles around the rectum prevent the entrance of the water into the colon, but a few trials enable any one to fill a greater portion of the colon. There can be no doubt of the benefit of a thorough washing out of the colon, and the occasional use of these high enemata may help to cure the constipation, but its continuous use is of doubtful propriety. In this respect, as in therapeutic measures generally, it is unwise to rely entirely on one remedy, an association of several being more efficient.

Exercise has much to do with alimentation, and especially in securing a daily stool, consequently daily walks and drives are essential. The amount of time spent in the open air should be as long as possible without tiring. All forms of exercise should be light so as not to injure, and all violent movements eliminated from any gymnasium or other exercise taken.

Massage and baths with frequent rubbing of the skin will be efficient aids to the treatment of these constipated cases, and should be given where possible. Massage of the abdomen following the line of the colon is of benefit. It should be done every morning.

The condition of the blood is a result of vicious conditions and next to their removal needs attention. The best drug for this purpose is iron, and it must be given fearlessly. The most satisfactory form of iron is Bland's pill, silver coated, and two or three five-grain pills should be given after each meal for several months. Forty or fifty grains of Bland's pill can be given daily with marked benefit. If head

symptoms or hemorrhage from the nose result, the amount of iron must be diminished or some other drug given.

Arsenic may be needed with or without the iron, the official liquor potassii arsenitis being an excellent form to use. The dose can be gradually increased as tolerance is established, and the drug can be used for a number of months without harm.

Cod-liver oil, milk, cream, and easily assimilated foods are required where the body weight has depreciated, the condition of the alimentary canal being attended to by use of such drugs as are indicated.

When the anæmia yields to the treatment the color returns and the general health improves. As a result of the restored normal condition of the system at large, the menses return and resume their monthly cycle.

Amenorrhœa with Plethora.—Amenorrhœa is occasionally found in women who incline to increasing stoutness; as they grow larger the amount of the flow becomes smaller each month, until it finally disappears entirely. These women are generally sterile, and usually have considerable pain at the time of their periods; they feel dull and listless, and have headaches and nervousness. Leucorrhœa is a common symptom, and sexual desire diminishes as the stoutness progresses.

Examination fails to reveal anything significant in the pelvis of these women as a rule. Occasionally there is ovarian tenderness and a sensitive vagina.

Treatment is usually not satisfactory. As these patients get stouter, the ovarian function is suppressed entirely, as a result of atrophy of those organs. The iodide of potassium,

with or without mercury, may be of benefit, as it will stop the accumulation of adipose tissue and may even reduce the weight. Cathartics may be needed, and if the patient is anæmic iron should be given; the syrup of the iodide of iron being an excellent form to give in the latter case.

Suppression of the menstrual flow may occur without known cause. There is neither wasting disease nor anæmia. Its beginning may date from a cold, a fright, or sudden shock at the time the flow is due, or from over-exertion or a bath taken about that time. The patient suffers little discomfort from anything but the amenorrhœa. She may have some distress each month about the time the period is due, with a feeling of heaviness in the pelvis, backache, and fullness about the top of the head.

Examination of the pelvis will reveal nothing except a slight congestion of the cervix and vagina, and even that may be absent.

Treatment is usually not required directly for the amenorrhœa, as that symptom usually disappears in a short time. If other symptoms are present they must serve as an indication for the proper plan of treatment. If the menses fail to return and no cause for their absence can be found, some of the various methods for starting them may be tried.

Among the drugs used to cause a recurrence of the suppressed menstrual flow the binoxide of manganese is probably the most popular. It is usually given in pill form, and the dose is from one to four grains three times a day. The action of this drug is usually prompt and the recovery is complete. The permanganate of potassium was formerly used, but has in a great measure given way to the man-

ganese. Iron, arsenic, and quinine have each a place in the treatment of amenorrhœa, which is chiefly due to the curative effect of these drugs for the conditions of which the amenorrhœa is a symptom.

The use of ergot, tansy, sandalwood oil, the fluid extract of cotton-root bark, and drugs of this class, is always dangerous. They all act by producing pelvic congestion or inducing uterine contractions. It must also be remembered that a frequent cause of amenorrhœa is pregnancy. This may occur in any case, and abortion is liable to follow the use of powerful emenagogues. Quinine and the binoxide of manganese may also produce abortion if given in large doses. Consequently pregnancy must be carefully eliminated before pushing these drugs.

In all forms of treatment for amenorrhœa the fact that it is a symptom must be kept in mind. The cause can frequently be found and will guide the treatment, and it is well not to be satisfied with any treatment until a cause for the symptom can be found. As knowledge of the generative organs becomes more exact the number of cases of amenorrhœa whose etiology is unknown will diminish.

Amenorrhœa from Hyper-involution.—Amenorrhœa occasionally results from hyper-involution following pregnancy. The symptoms are not many as a rule. The absence of the menses is supposed to result from lactation while that function lasts; but after the child is weaned the menses do not return, and a physician is consulted. The woman may think she is pregnant again, as many women, especially among the poor, are pregnant before they cease nursing. I knew of one woman who never menstruated in seventeen years, being

all the time either pregnant or nursing. An examination made a few months after delivery would discover the tendency to atrophy from the too long continuance of the involution process. This examination should always be advised by the accoucheur.

Examination of the pelvis will discover a small uterus with a short cervix. The ovaries can seldom be made out at all and are small. There may be paleness of the vaginal mucous membrane and cervix. The uterine canal is short.

Treatment by electricity or frequent passage of the sound, with drugs for the general health, will usually restore the function in a few months. A subsequent pregnancy will enlarge the uterus, and a return to the normal size usually follows its termination.

Amenorrhœa Following Castration.—Amenorrhœa as a rule follows removal of the uterine appendages when both are taken out. The flow may return from habit for a few months or even a year, but the rule is for it to cease in a very short time. When the menses continue for a considerable time it is frequently the result of a small amount of the ovarian tissue that has escaped the surgeon in the removal. Periodic uterine flow has resulted when only a small piece of the tube was left adherent to the uterine horn, and ceased after its removal by subsequent operation.

Examination may demonstrate the presence of considerable congestion of the uterus. The hemorrhage may result from contracting bands in the pelvic peritoneum, causing either direct or reflex irritation. When present, these bands of adhesion can usually be made out by vaginal touch.

They frequently cause much pain, and may involve intestines, causing obstruction.

The treatment consists of douches and vaginal applications for the uterine congestion, as will be described in the chapter on uterine hemorrhage. Remedies for removal of the adhesions are also indicated. The latter object is at times accomplished by the use of Monsel's solution and firm packing of the vagina with tampons. In order to accomplish much in this direction the applications must be made as often as can be borne and their use continued for a number of months.

If no progress is made in two or three months, electricity may be tried. The faradic or galvanic current may be used, and can be sent through the adhesions by placing the internal electrode either within the uterus, or first in one lateral fornix of the vagina and then in the other. The advocates of the use of this force to dissolve pelvic adhesions claim to get excellent results with it, and it should have a trial in all obstinate cases. A second laparotomy may be necessary to remove these adhesions.

The object of treatment is to hasten the advent of the premature menopause which should result from the removal of the ovaries. The manner of its coming is similar to the normal process, and the symptoms are the same. In order to avoid repetition they will be described in the pages devoted to that condition which follows.

The Menopause is the normal cessation of the ovarian function as a result of age. It marks the termination of the dual existence of a woman. From puberty to this time the woman lives as an individual and also as a factor in the

perpetuation of her species. The latter part of her condition is the one made most prominent during its activity, and the one for whose accommodation her individual existence is made subservient.

Each ovulation is a setting free of an element from her capable of being developed into a new being. This liberation of ova is only suspended during gestation and lactation, the energy of the mother being drawn upon to furnish material for the development of the growing offspring during this time. The only other suspension of the function of ovulation is when the integrity of the individual suffers to such an extent as to make it impossible to continue the process and live. Then the individual asserts itself and a conservative cessation results.

When the ovaries begin to atrophy from age, their function gradually becomes less active and eventually ceases entirely. These results of senility cause the climacteric, or "change of life."

Ovulation may permanently cease when the woman is quite young, causing a premature menopause; but it is usually the result of senile atrophy of the ovaries. The age of a woman's generative organs is not always measured in years. In rare instances the menopause has been passed by a woman under the thirtieth year. The usual time is between the forty-second and the forty-seventh years. Occasionally the menses continue until after the fiftieth year, and rare cases are met in which the function is active beyond the sixtieth year or even later.

When the menstruation continues after the usual time an examination is advisable, as the flow may continue as a re-

sult of fibroma or carcinoma. This is especially important when the discharge has been absent for a time and returns. Women often look upon this event as an evidence of a return of youth, and do not seek advice until the disease causing it is beyond the reach of treatment. The importance of early appreciation of cancer and the fact that neoplasms in the uterus of old women are usually malignant, calls for examination at the earliest moment, when suspicious flow of blood is found.

The menopause rarely is inaugurated suddenly. The process is usually a gradual one. When the woman is well and her surroundings normal the change is generally attended with little inconvenience. But few women are in perfect health at this period of life, consequently considerable suffering results during the change in most cases.

The beginning is usually marked by missing a period, or she may go three or more months without menstruation. Then there is one or more normal periods followed by a longer interval, and the change tarries along for a year or two. In other cases the time between the periods gradually lengthens to five weeks, then to six, and so on until it ceases. Women may miss one period and then be perfectly regular for six months or more before missing another. Again, the change may be in the amount of blood lost at each period. This will be less each time, until it is lost entirely. At times, after an absence of one or two months there will be one or more periods marked by an excessive loss of blood. Rarely the change is abrupt, the last period being normal in all respects and the function ceasing with it, never to return.

The importance of a knowledge of the manner in which

the menopause comes and the symptoms usually found resulting from this change is that the physician may be able to distinguish it from other conditions. It is a physiological process, and should not be confused with any of the pathological changes that may occur. The earliest signs of the climacteric are of especial importance.

There are some *symptoms* of beginning menopause that can usually be found before the changes in the menstrual discharges are noticeable. Naphey claims that the very first sign of this change is the beginning of the accumulation of fat. This, he claims, is first "visible in the lower part of the neck on a level with the lower two cervical vertebræ." The fat in this position often grows to "form two distinct prominences," and "is an infallible indication" of the period in the woman's life.

The usual tendency is to go on to increased stoutness as the change is completed. This is especially the case when the woman is in health. Many women are better after the menopause than at any time in their life.

When the amenorrhœa of the climacteric appears there are usually a few days at the time the flow should come during which considerable inconvenience is experienced. At this time the woman will have feelings of fullness in the head, a flushed face, and general distress in the chest and abdomen. A frequent complaint with these patients is that the blood formerly lost has gone to the head. At the same time considerable distress is felt in the pelvis. A feeling of heaviness, which is aggravated by the upright position, is common. Irritability of the bladder is frequent, and irritable bowels causing diarrhœa occasionally occurs; more fre-

quently the latter symptom is supplanted by constipation, with much bloating of the abdomen from gas in the colon and intestines. It is not uncommon for these women to imagine they have a tumor, or, as they express it, "something growing" in the abdomen. The moving of the gas in the bowels has been mistaken for fetal movements even by women who have had a number of children. This fact with the amenorrhœa present has caused many a patient to think herself pregnant when it was the beginning of her climacteric. This error must not be too readily acquiesced in by the physician.

Neurotic symptoms are common in women at the time of the transition from active to inert sexual life. The disturbance in the circulation acts on the nervous reflexes and on the great nerve center, the brain. The symptoms caused by this irritation vary from simple attacks of "nerves" to dementia or active mania. There may be hysteria or paraplegia. In fact, this period of life may be productive of any or all of the numerous ailments of a reflex character that characterize pelvic disease at any time. It is a time of anxiety to the patient and her friends.

This is the time when pelvic growths are apt to make their presence known. *Fibromata*, if they have not been discovered before, will increase the symptoms and cause the woman to suffer more. But the fact that tumors of this character usually grow smaller as the ovarian function ceases makes them of less importance. If the tumor has not caused inconvenience before the menopause begins, it can usually be managed without great interference, for, as the congestion incidental to the menstrual flow ceases, the blood-supply for

the fibroid is diminished. The result is atrophy of the tumor at the same time that the physiological atrophy goes on in the ovaries and uterus. The surgeon takes advantage of this natural method when he induces an early menopause by castration.

On the other hand, tumors of a *malignant* character do not have a tendency to self-cure as a result of the dying ovarian function. They seem rather to be aggravated by this change in their surroundings. The lessened blood-supply promotes the tendency to necrosis of tissue and the consequent sloughing is greater. The extension of the growth to other parts meets less resistance from the less active tissues and is consequently rapid.

Examination of the pelvic organs should always be made about the fortieth year. The frequency of serious disease at this time makes this important. Many cases of cancer would be discovered in time for radical removal if this were more frequently done.

The accumulation of fat will be discovered first on examination, and uterine exploration of the pelvis will show the cervix large and congested. This will be greater if the examination is made at the time the menses should occur. If a tumor exists in the pelvis the symptoms due to it will also be found.

The Treatment is dependent on the complications. If none exists, the treatment is entirely palliative. At the time the menstrual flow should appear the pelvic congestion can be relieved by painting the vagina with iodine and creosote, followed by the application of tampons saturated with glycerine. This treatment can be repeated every second day

until the distress is relieved. After the removal of the tampons copious hot-water douches should be used two or three times daily until the next treatment. This will diminish the pelvic congestion and relieve the head symptoms. When applying the tincture of iodine and creosote to the vagina it is advisable to make an intra-uterine application of the same solution to help remove any tendency to metritis that may exist.

The neurotic symptoms that are frequently so annoying can be controlled by the bromide of sodium in full doses. If much flatus be present the rhubarb, soda, and ipecac mixture with nux vomica will be of service, or the following combination containing the bromide may be used:

℞

Sodii bromid	ʒ j
Pulv. carbon	ʒ ij
Ext. pancreatici	ʒ j
Aqua. anis. q. s. ad.	ʒ iij

M. Sig. ʒ j a half-hour after meals in water.

The condition of the evacuations must be inquired into and cathartics or laxatives given as indicated. Where much debility exists iron and other tonics must be given, and if there is tendency to lose flesh cod-liver oil must be added.

Much patience is required with women during this transition period. They require encouragement in large quantities. The support of a tampon in the vagina will at times allay much of the distress complained of, and it may be needed once every week or fortnight for a long period of time, even when no pelvic symptoms are present.

The use of opiates must not be allowed, as great danger

of acquiring a habit exists. The powers of endurance are frequently taxed to the utmost and control of appetite materially impaired. Alcoholic and malt drinks must also be interdicted for the same reason. The use of whiskey and gin to hasten retarded menstrual flow is not in accordance with the therapeutic indications and should be discouraged. The only effect alcohol can have is to produce a slight numbing of the nerves of sensation. It does not promote an increase in the amount of the flow nor in any way modify it.

Moderate open-air exercise is beneficial, and should be encouraged to prevent the tendency to melancholia so frequently present. The attendants of these old women must be cheerful and capable of encouraging them out of their "blues." They should be encouraged to employ their time in some light labor to prevent *ennui* and keep them from brooding over their ills and woes.

CHAPTER IV.

SCANTY MENSTRUATION.

Scanty Menstruation, like amenorrhœa, is a symptom and not a disease of itself. The diseases causing each are in many cases the same. At times the scanty menstruation is only the beginning stage of an acquired amenorrhœa. The amount of the flow may be only slightly less than normal. The fact that women vary greatly in the amount of blood lost must be taken into consideration in deciding whether or not the flow is too small. An amount of blood that would be copious for one woman might be slight for another.

Causes.—Scanty menstruation, when found with anæmia or wasting disease, becomes simply a symptom of these conditions and merits no special consideration of itself. There are cases of scanty menstruation found in women who seem to suffer only from the pelvic condition causing it. For some reason the blood in the pelvic tissues does not make its exit in the usual amount and a condition of pelvic congestion exists as a result. The causes of this failure to have a free flow are obscure. They are at times neurotic, and again they may be the result of the condition of the blood.

When the blood is thick from any cause it finds difficulty

in making a passage through the walls of the vessels. Patients who have this cause for their scanty menses are usually plethoric and of sluggish habits. Their circulation is poor, they move slowly, and their minds are inert. They are, at times, anæmic, and frequently have jaundice. They are capricious eaters, with poor digestion and constipation. The menses last only a day or two, the amount of flow being slight. Dysmenorrhœa, leucorrhœa, and "nerves" are other symptoms frequently found.

Another class of women with scanty menstruation differs materially from those described above. They are small, wiry, energetic women, peaked faced and poorly nourished, but full of restless energy. Anæmia is usually present in these patients, but they flush easily on exertion or when excited. A proclivity to enter into whatever they undertake with more force than they have strength to endure is a prominent characteristic of these women. They are given to "blues," and again they are exceedingly joyous, passing from one state to the other with the greatest rapidity.

Chronic inflammation near the uterus is also given as a cause of scanty menstruation.

Other *symptoms* present with the scanty menstruation are dysmenorrhœa, leucorrhœa, and constipation. The small amount of blood lost is in part due to the fact that they use up too much vitality in their work or pleasure to allow much to be lost in menstrual flow. Then the congestion of the pelvic vessels acts as an irritant, stirring up the whole nervous system through the reflexes. These patients may become hysterical or have other nervous complications.

Cases of *delayed* menstruation are frequently found with

the scanty menstruation. The menses do not come at the usual time, but a few days after time. The symptoms precede the flow for several days, and are characteristic. The pain of a dull aching character is felt in the lower abdomen. There is bearing down, backache, and the general feeling as if the menses were about to appear. But they do not come on, or it may be after a number of hours that a slight show is seen, which only lasts a short time. When it stops the symptoms become more severe. The heaviness in the pelvis and the dragging-down feelings last for several days, when they are relieved by the inauguration of the flow in sufficient quantity, or are increased by its failure to come. If the period does not come the symptoms gradually fade away after a number of days, and may be entirely absent until just before the time for the next menstruation.

Another cause of scanty menstruation is uterine displacement, especially retroflexion of a large heavy uterus. The latter condition, however, is more frequently accompanied by an excessive menstrual flow. The beginning of the period may be delayed a number of days even when a profuse menstruation results.

Examination for Scanty Menstruation.—The condition of the pelvic organs when examined will vary, their condition depending on the time at which the examination is made. If examined immediately before or after the menses much congestion will be present in the vagina and cervix. The uterus will be large, boggy, and tender on pressure. It frequently is displaced, but may be normal in position. The symptom of chief importance is the congestion. This is due to an engorgement of the tissues with blood which

should be removed by the menstrual flow but is not, because the flow is scanty. The presence of congestion is shown by a drop of blood that usually follows the probe when withdrawn. The ovaries may be swelled and tender, and at times are displaced into the cul-de-sac of Douglas.

As seen through the speculum the vagina and cervix are thick and deep red from the presence of too much blood in their vessels.

Treatment.—This engorgement gives the cue to the treatment. Anything to relieve the pelvic congestion will improve the condition of the patient, though it may not cure the scanty flow at once. A number of remedies are employed for this purpose. Space given to each will be found most satisfactory in describing them. As some of the simpler methods will usually be tried first they will receive first mention. Several of them may be carried on at the same time.

The treatment of the general health has been outlined in the chapter on amenorrhœa. Everything must be done to build up the system, to increase the assimilation of food, and to restore the tone to all the tissues of the body.

The use of remedies directly to the pelvic organs is also needed. Two methods exist by which this congestion can be lessened: either the blood can be driven out of the pelvic organs, or it can be withdrawn by measures which remove it. I unite with Davenport in thinking that the applications to drive the blood from the pelvic organs are indicated during the inter-menstrual period, while the depletion is required just before the time for the period. The first indication is met by the use of copious hot-water douches (after

the manner to be described) during the interval between the periods. Treatment of the vagina and cervix are also made every five days during this time. For depleting the tissues just before the menses appear, the douches must be discontinued and other measures substituted. It is also well to give a brisk cathartic at this time, thus depleting the immediate neighborhood of the bowels. Two or more laxative pills containing aloes can be given at night for this purpose. If the menses are usually delayed, a treatment with electricity may hasten their coming. The negative pole is applied within the uterus as directed for amenorrhœa. This may cause a more abundant flow at the same time that it causes it to come sooner. If sufficient flow fails to appear as a result of the electricity, some depleting measure must be employed. Puncture of the cervix is a method frequently used. The application of a leech to the cervix resembles the natural method more and is consequently preferred by some. These methods both remove the blood entirely from the tissues. The use of glycerine tampons depletes in a different way. These tampons are saturated with boro-glycerine and new ones inserted every ten or twelve hours. The action of the glycerine causes the serum of the blood to enter the vagina and find its exit by following the cord to the vulva. These glycerine tampons are used for several days, until sufficient serum has been removed from the pelvic circulation to relieve the congestion. The treatment with hot-water douches is resumed a few days later.

As has been stated in writing of amenorrhœa, the various drugs supposed to act directly on the uterus are not reliable. They almost never do any good, and frequently do harm.

The use of *vaginal douches* to drive the excess of blood from the pelvis calls for a more detailed description. In the first place the douches must be copious so as to insure a prolonged contact. An appliance must be had that will hold at least six gallons, and the tampons must be high enough to produce contraction of the muscular coats of the arteries. This latter condition is the result to be obtained by the hot-water douches, and when the stimulus is sufficient the vessels remain contracted for a number of hours.

The details of giving a douche and the preparation for it are important. It is very often given improperly, producing results that are disappointing to the physician and discouraging to the patient.

The first consideration must be for the appliance for giving the douche. The syringes formerly in use are not suitable for this purpose. The Davidson pattern gives an irregular stream of water. The force exerted by the water striking the tissues is irregular and spasmodic. It may be sent in with enough force to set up inflammation. This objection has been partially overcome by the use of an elastic bulb or pipe between the hand-bulb and the tip. This gives an almost continuous stream, and lessens the force of the first impulse. But the other objection to this variety of syringe is a greater one. When it is required to give a douche of five or six gallons of water much labor is required to pump so large a quantity. This is more laborious when, as is frequently the case, the patient attempts to administer the douche herself. It is very tiresome to pump so long, and the uncomfortable position in which it must be done makes it much more so. When a copious douche is at-

tempted with this appliance the patient will usually tire out and quit before half the needed amount has been used.

Syringes on the fountain pattern are right in principle. The water runs from the force of gravity, and the force can be regulated to any degree by changing the height of the reservoir. They do not tire the patient when she gives her douche to herself. It is well to remember that much force can be obtained by a very small stream of water. Women are, many of them, not acquainted with the laws of hydraulics. It is safest to caution them not to place the reservoir too high. The exact height had best be stated, and if possible she should be shown just where to place it. For copious douches, one or two feet above the level of the hips is as high as is prudent.

The Reservoir.—The fountain syringes formerly in use had the fault of a small reservoir. The largest of them had a bag holding but three or four quarts. More recently tanks have been made that will hold several gallons. The best size is not less than six gallons in capacity. These tanks are usually made of tin, and have an outlet near the bottom to which a rubber pipe can be attached. It is a convenience to have a stop-cock at the outlet. Figure 24 is a cut of Reynolds' tank; its capacity is six gallons.

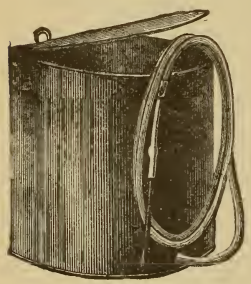

Fig. 24. Reynolds' Tank and Tubing for Vaginal Douche.

The *rubber tubing* should be long enough for convenient handling. At least ten feet is required to meet ordinary contingencies. A cut-off should be on the tubing with

which the stream of water can be controlled. It is most convenient to have a cut-off that is movable on the tube. It can then be used by the patient herself or by a nurse, as the case may be. The necessity of this appliance is that everything may be prepared before the water is turned on. The stop-cock at the reservoir can be opened, allowing the tubing to fill down to the point where it is compressed by the spring. After everything is arranged for the water to run, the catch is released without change of position. The stream can be stopped at any moment in the same way, thus placing it under perfect control.

The Vaginal Tip.—The remaining part of the syringe is as important as any. It is the point to carry the water into the vagina. These points or tips were formerly made of metal. In using hot water this is a serious disadvantage, the metal becoming so hot as to cause much suffering. Water that is not hot enough to injure of itself can make a metal point hot enough to burn the mucous membrane with which it is in contact. Recently the syringe points are made of hard rubber. They do not get hot, and cause no discomfort from this cause.

These points were formerly made with one opening in the end and several around the sides. This opening in the end of a syringe point for the vagina is dangerous. Attacks of severe pain have frequently followed their use. This pain is supposed to be due to the entrance of water into the uterus. When a stream of water strikes directly against a large, open cervix it is easy for some of it to be forced through. The pain resulting from this accident is severe, and frequently lasts several hours. The patient will speak

of it as an attack of "cramps" in the lower abdomen which came on soon after the use of the syringe. The vaginal tips are now seldom seen with an opening in the end. But occasionally a patient will use one of the other points that come with her syringe. The point intended for the rectum is the one most frequently used in this way. Many women think the vaginal point too large and select the smaller one. When cramps follow the use of a douche it is well to investigate the manner in which it is taken. The height of the tank or the point used may either of them cause the pain.

With poor patients the matter of cost is an item of importance. Instead of a tank and tubing, a long piece of tubing with a bulb near its lower end may be used with a pail or any receptacle for the water instead of a tank. The only important thing is to be sure it is large enough. The tubing is fastened over the side of the pail and a contraction of the bulb forces the air from the tubing. When the bulb is released the tubing is filled with water and a siphon action is started which will continue until the water is below the end within the pail.

The Position of the woman while taking the douche is important. It is also a necessity to instruct her. In almost every case she will use it while in an improper position if left to her own guidance.

It is much more convenient for her to douche herself sitting over a vessel. It is impossible to reach the entire mucous membrane of the vagina by water injected while in this position. A certain amount of cleansing may be accomplished in this way, but the prolonged contact of the water with the mucous membrane, so important at times,

cannot be obtained. The water runs out as fast as it enters the vagina and does not fill the canal or expand its folds. In order to accomplish this the patient must assume a position that will cause the outlet of the vagina to be its highest point. The position on the back with the hips higher than the shoulders will secure this result. The patient must be taught to assume this position whenever a douche is to be taken for the medicinal action of the hot water. When the douche is taken simply as part of a bath the vagina can be more thoroughly cleansed when the patient assumes the dorsal-recumbent position. And for the introduction of medicated solutions no other position will insure contact of the solution with all parts of the mucous membrane of the vagina. The dorsal position is even more important when the heat from the water is the element indicated as a therapeutic measure. Prolonged and intimate contact of the water with the entire vagina is then necessary. When the pouches around the cervix are lower than the outlet of the vagina, the weight of the water causes them to enlarge and push farther back at the sides of the uterus. The hot water is thus permitted to surround the entire cervix and much of the lower uterine segment. It also is brought much nearer to the appendages and the peri-uterine tissues. The result is that the contractions induced by the heat reach all the vessels in the cervix and vagina, and the vessels of the deeper tissues are also caused to react to the heat stimulus. The uterine arteries and even the ovarian arteries are affected by this means. When it is required to drive the excess of blood from the organs supplied by these vessels the action of the hot water will cause

them to contract, and thus the amount of blood carried by them is materially diminished. The contractions in the muscular tissues around the vessels will help to expel the blood from the veins at the same time.

The effect of the hot water is greater if the contact is for a considerable length of time. In order to obtain this the flow should be slow and the quantity of water large. To secure a stream of water with little force and slow action the tank containing the water must be very little above the hips of the patient. The holes in the point must be small, for the same reason. With these conditions and a tank holding six gallons, from twenty to thirty minutes will be consumed.

The Bed-pan.—Having provided means of giving the douche properly and decided upon the correct position for the woman to occupy while taking it, the next consideration must be to provide some means of catching the water as it escapes from the vagina. When the patient stoops over a vessel or sits on one, the escape of the water is already provided for. When she lies on her back on a bed or couch the water will run backward over the anus and something to receive it must be provided. The old-fashioned earthen bed-pan cannot be used when large quantities of water are to be used. It will not hold enough. Moreover it is a heavy article, and very uncomfortable to lie upon.

Numerous light bed-pans have been devised within the past few years. They are made of tin or rubber-covered tin, and provided with means of removing the water before the patient gets up. The *Reynolds* pan is the best one at present in use. The pan is light in weight, it is not too

high, and it can be emptied by a siphon before the patient rises. These are all important considerations. When the patient is her own nurse the weight of a bed-pan is an item. These women are the ones most easily injured by lifting, and its necessity should be avoided. The fact that it is low makes it more comfortable, and the comfort of a woman while taking a douche lasting a half-hour or more should be considered.

The *siphon* attachment to drain the pan can be used at either side of the pan. There are two metal tubes extending to the bottom at the side of the pan which goes farther up the patient's back, as this is the point liable to be lowest when the pan is in position. These tubes pass upward and outward along the inner surface of the sides of the pan and find an exit, one at each side. The end of each tube extends a short distance beyond the pan, and the siphon can be attached to either.

The siphon is a short rubber tube with a bulb near its middle. After this is attached to the end of the metal tubing a contraction of the bulb will fill it with water and the water will flow as soon as the bulb is released. In using this bed-pan the siphon is started after some water has entered the pan. It will run during the time of taking a douche and as long as any water remains in the pan. By the use of this appliance the water used can be carried into a vessel by the bedside and no danger of getting

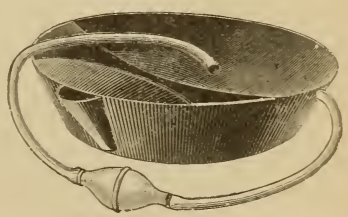

Fig. 25. Reynolds' Bed-pan with Siphon Attachment.

the couch wet exists. Figure 25 is a cut of Reynolds' pan with the siphon attachment.

The Baker bed-pan is large enough to hold six gallons. It has no siphon to empty it. It is high and consequently uncomfortable, and it may be upset in getting off it and the water spilled.

The so-called French bed-pan has many of the advantages of Reynolds'. It is small, light, and comfortable. Instead of a siphon it has an exit with a stop-cock. This is not at the side, but at the part of the pan toward the woman's feet. It can be opened before the patient lies down, but is inconvenient to reach when the pan is in position. It is not made in the United States, I believe. At least I have been unable to find one.

The douche appliance of Reynolds' is perfectly satisfactory in most respects. Occasionally a patient will be found who cannot get the siphon to work. But a little showing will soon make that all right. The cost is not great.

In starting the douche the water should be allowed to flow into the pan until all air is expelled from the tubing. This also allows the water which has cooled in the tube to be expelled.

As has been said, the reservoir must be a very short distance above the level of the vaginal outlet. The force with which the water strikes the uterus may be painful when only a foot or two of pressure is used. Some patients are so sensitive that they cannot bear a douche at all. But usually a few trials will enable them to take it.

The *introduction* of the point into the vagina can be awkwardly done. Many women are entirely ignorant of the

anatomy of these parts. The end may be pushed into the urethra or she may be unable to get it into the vagina at all. Other women will imagine the vagina is too small to admit an ordinary vaginal tip. These are the women who use the rectal tip because it is smaller. When they do use the larger point they frequently put it in only a short distance. When this is the case the improbability of reaching the entire vagina with the water while she sits upright is greater. If she is in the dorsal position the vagina will be filled, even if the point of the syringe only enters a part of the way. A more satisfactory result is obtained if the tip is introduced its entire length. In directing the patient how to introduce the syringe point it is well to advise her to keep near to the perineum. She will thus avoid injuring the vestibule. Manipulation of the sensitive labia minora is also avoided. This latter consideration is important with very young girls, as onanism may be acquired in this way. Those patients who need local treatment for scanty or absent menstruation are apt to have considerable irritation around the external genitalia, and consequently are in a favorable condition to acquire bad habits. The point of the syringe should always be anointed with oil or vaseline before it is introduced.

The *time* for using the douches can be regulated somewhat to suit the convenience of the patient. The effects of a copious hot douche on the circulation will last six or seven hours. Consequently they should be used at least twice a day. When only two douches are used, one should be in the morning and the other in the evening. The time should be regulated so that the patient can remain in bed for a half-hour or more after the douche is completed. This will give

time for the weakness that frequently follows the taking of a large douche to pass away. If this weakness does not pass away before the time for using the next one, the interval must be made longer. Some patients will be so depleted as to impair the general health if the precautions above mentioned are not taken. If any loss to the general strength results, the use of the hot water must be stopped at once. Occasionally the quantity may be made smaller than six gallons to advantage.

Applications.—During the time the douche is being used to relieve the congestion in the pelvis, other applications can also be made to the vagina to advantage. About every fourth day the physician should make a treatment, either at his office or the patient's house. The patient can be treated while in the Sims position or in the dorsal position. If the Sims position is used, Cleveland's speculum can be used if no assistant is at hand. The ordinary bivalve is used when she is in the dorsal position. The result is the same in either case.

When the patient is in position and the speculum inserted, the first thing to do is to cleanse the mucous membrane on and around the cervix. To do this a small piece of cotton is grasped in the blades of the dressing forceps and the vagina mopped out with it. The cotton should be caught by the forceps in such a manner that enough of it projects beyond the ends of the blades to cover them and thus save the mucous membrane from abrasion. If the mucus or other substance adheres to the membrane, a small piece of the cotton can be dipped in the basin of warm water, which should always be at hand, and the entire mu-

cous surface bathed. When the cervix is open, its interior must likewise be cleansed. The plug of tenaceous mucus, so frequently present in the cervix, should be removed. It may be necessary to dip the cotton in some solvent to remove this substance. Alcohol, acetic acid, carbolic acid, or tincture of green soap can be tried. After the parts are thoroughly cleansed the application can be made. The medicine can be applied by grasping a very small bunch of cotton in the dressing forceps and dipping it in the jar containing the drug, or a small piece of cotton can be wrapped on the end of an applicator and used in the same way. The forceps will be found more convenient, and if their blades end in very narrow points, as they should, they will answer every purpose.

The preparation used can in this way be applied all over the external parts of the cervix and the vaginal vaults. If the external os is at all open, the cervical canal should also be treated at the same time. If application to the endometrium is indicated the uterine applicator is wrapped with cotton and used in the way elsewhere described.

The substances usually applied to the vagina and cervix for the congestion present in scanty menstruation are those which produce contraction in the membrane. Tincture of iodine, or Churchill's tincture of iodine, is most frequently used for this purpose. My favorite solution for these cases is a solution containing equal parts of beechwood creosote and tincture of iodine. This mixture combines the astringent effects of the iodine with the cleansing, deodorizing action of the creosote. The latter drug is also a good styptic and a counter-irritant of considerable strength. A mix-

ture containing equal parts of liquid carbolic acid and tincture of iodine can be used instead of the above solution. It is not quite so elegant a solution, but it is probably as efficient. Either of these mixtures can be applied to the interior of the uterus at the same time the applications to the vagina are made, if such medication is indicated. If a more powerful counter-irritant is indicated than any above mentioned, the pure Monsel solution can be used. This can be applied generously over the vagina and cervix with safety, but it is not advisable to apply it beyond the internal os.

After making the applications to the cervix and vagina a small tampon well saturated with glycerine is applied high up in the vagina. If there is much room in the pelvis it may be advisable to put one tampon at each side of the cervix in the lateral vaginal pouches. The tampons should be worn from twelve to twenty hours and then removed. The douches should be resumed after their removal.

Depletion at the Time of the Flow.—The manner of depleting the congested pelvic organs at the time the flow should come on requires some explanation. Of the use of tampons to withdraw the blood serum enough has already been said. The methods that actually remove the blood itself merit description somewhat in detail. They are by puncture, scarification, or by leeches. When it is desired to relieve the congestion of the uterus by puncture a knife-bladed tenaculum or a very narrow-bladed bistoury is used. The latter is easier controlled and consequently preferable. The blade is pushed deep into the cervix in several places around the external os. Care must be taken not to cut the circular

artery that surrounds the cervix. Its position can be fixed by feeling its pulsations with the finger.

After the punctures are made the bleeding can be encouraged by a warm-water douche with a temperature less than 105° F. It may be necessary to check the bleeding if it continue too long.

Scarification is done also with a bistoury, as a rule. A tenaculum may be used, but it is apt to make tears with ragged edges, which is an objection. A number of shallow marks or cuts are made over the cervix, sufficiently deep to cause oozing of blood, and then the flow is promoted by warm douches. Either of these methods is open to a number of objections. The punctures may injure the tissues of the cervix if deep enough to cause sufficient blood to flow. Each method leaves a number of openings in the mucous membrane for the entrance of germs. In either case the amount of blood may be either too much or too little. Excessive flow is more liable to follow puncture than scarification.

The Use of Leeches.—Professor Davenport, to whose description of its use I am largely indebted, advocates the use of a leech for this purpose. His manner of using it can best be described in his own words:

"For several years I have used a method by which there is a great saving of time and fatigue both to physician and patient. With the patient on the side and Sims' speculum in position, the cervix is well brought into view. The leech is then grasped with the uterine forceps about half an inch back from the head as it is extended, and held against the cervix. As a rule it takes hold almost immediately; but if

not, bringing the leech outside and taking a fresh hold will after one or two trials be crowned with success. At first thought it would seem as if the pressure of the forceps might so injure the leech that it would not draw as well, but I have found that even clasping the forceps on the neck of the leech is followed by no bad results. Usually it is necessary only to hold the animal firmly, gradually letting up the pressure as he takes hold; but as a strong one will often squirm away from the forceps, it is sometimes necessary to clasp them.

"If the process is watched, it will be seen that the head flattens out as the leech inserts its three hooklets preparatory to beginning suction, and as that is seen the pressure of the forceps may be diminished. If the leech does not show a readiness to do this, a fresh hold had better be taken rather than persevere with the old one.

"It seems as if the discomfort from the pressure of the forceps is a stimulus which induces the leech to bite, and teasing it a little before introduction, so as to make it lively, is of help as well. Leeches vary, and of course one will be found now and then which will not take hold. Occasionally, scarifying and drawing a drop of blood will prevail upon a reluctant leech to bite.

"The leech being under perfect control in the grasp of the forceps, it is not necessary to plug the os uteri to prevent its crawling in. If it should happen, the best plan is to wait patiently, and within half an hour at least the leech will appear again. The leech should be made to bite on the crown of the cervix, not too near the os, nor too far over the side. The amount of blood lost depends upon two factors,

the capacity of the leech and the subsequent behavior of the bite. Leeches vary in size, and will draw from two to four drachms before dropping off. How much subsequently flows will probably depend upon the vascular distribution of the part where the bite is. If there is much engorgement, or if the leech happens to wound a superficial vein, the subsequent flowing may be so great as to occasion alarm. As a rule, if the patient keeps quiet the amount of blood lost will be sufficient to soak from two to four napkins. This, with the amount abstracted by the leech itself, is usually sufficient to relieve the congestion which is the accompaniment of the scanty menstruation. If the engorgement is very marked and the person plethoric with very scanty menstruation, two or even three leeches may be used with good effect."

In using a leech in the method just described I find one change a convenience. The Sims position is necessary because it is very tiresome to the patient to lie in the dorsal position long enough to apply a leech and permit it to fill itself. But it is also trying on the physician's assistant or nurse to hold a Sims speculum so long. The Cleveland speculum can be held indefinitely by the band across one shoulder and beneath the other arm. If properly adjusted it is not as uncomfortable to the patient as the Sims speculum, because it does not pull the perineum backward in the same forceful way.

In applying a leech some *precautions* are needed. It must be understood that it is really an operation and be prepared for accordingly. The conduct of the patient for some hours afterward must be regulated with the same fact

in view. In the first place, it should be done at her home, if possible, where she can be put to bed at once and remain for a while. A leech bite may cease to bleed very soon after the active process is over. Again, a dangerous hemorrhage may result. Some people are by nature bleeders, and it is difficult to stop the bleeding when it is started. These hæmophila are not apt to suffer from scanty menstruation. They are more prone to have menorrhagia, but they may have amenorrhœa with resulting congestion.

After the leech is removed the entire vagina is cleansed with cotton in the grasp of the dressing forceps before the speculum is removed. The patient must then lie still for several hours, and the amount of blood lost be kept track of by the napkins soiled. All clots expelled must be kept for the physician's inspection at his next visit. She should be seen in not less than ten hours after the operation, and sooner if possible. If it is necessary to leave her longer she should be instructed in methods of controlling hemorrhage. Hot water at 118° F. or hot water with tannin or alum can be advised. The recumbent position is necessary, and she

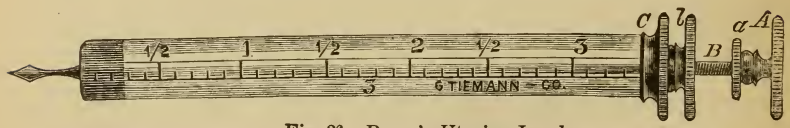

Fig. 26. Reese's Uterine Leech.

should be instructed how to pack the vagina with cotton, and several tampons should be left with her. Most of all, she must know the possibility of the hemorrhage being dangerous, and impressed with the necessity of notifying

her physician in case of its occurrence. In cases where the gynecological adviser is from a distance a local physician should be called in and requested to control the bleeding.

An artificial leech has been invented for depleting a congested uterus (Fig. 26). This instrument has the advantage of more perfect control than can be had in using the animal. The surgeon can select his location to apply it, and can regulate the amount of blood removed to suit the indications.

CHAPTER V.

MENORRHAGIA AND METRORRHAGIA.

Uterine Hemorrhage.—Hemorrhage from the womb is an event of monthly occurrence in the lives of women during the greater part of the time from puberty to the menopause. The amount and character of this discharge of blood has already been described, and the object of the present chapter is to devote some attention to the excess in this flow. As has already been stated, women become so inured to the discharge of blood from the vagina that they view the loss of enormous quantities from this source with utmost sang-froid, and often do not seek advice until they are thoroughly blanched from it. The quantity of blood which can be lost and recovered from is also a source of surprise to the attendants. Frail women often go on month after month losing excessive quantities and yet are able to be up and at work a considerable portion of the intervening weeks.

An excess of the menstrual flow at the usual time is called menorrhagia. Hemorrhage between the periods is called metrorrhagia. These two conditions are frequently present in the same case, and at times the loss of blood becomes so continuous that it is impossible to decide when the menses do occur, or if there is any form of flow except the pathological one. When this is the case the flow is called metrorrhagia.

As a matter of convenience the two conditions will be examined separately. It will be found that many of the causes producing metrorrhagia also produce menorrhagia. The converse of this state does not have so general an application.

Menorrhagia, or too copious menstrual flow, is, like amenorrhœa and scanty menstruation, a symptom of a number of widely differing diseases. The amount of the flow may only be excessive during one or more days of the period, or the number of days may be increased and the quantity of blood lost each day may be but slightly more than normal, or the quantity may be so great as to cause death from hemorrhage. The last condition is not very common. The depleting effects of a very free menstruation may last for a long time, causing anæmia and generally impaired health. This is more frequently produced by the cumulative effects of too free bleeding for a number of months.

Menorrhagia may result from causes existing in the generative organs, or from causes existing in the blood.

The *local causes* of menorrhagia are fibroid in the uterus, metritis, and pelvic congestion due to any cause. Occasionally it results from inflammation in the appendages or the pelvic peritoneum. Any other form of pelvic congestion may have menorrhagia as a symptom at some time during its course. Uterine displacement, especially retroflexion, is a frequent cause of excessive menstruation.

Carcinoma of the uterus during its early stages produces menorrhagia. Frequently this is the only symptom complained of before ulceration commences. In the later stages of cancer the hemorrhages occur between the menstrual

periods, and the disease frequently reaches a stage when there is some blood lost each day.

There is excessive menstrual flow present as a symptom of subinvolution due to retained placental remains, but as a rule the hemorrhage occurs between the periods as well.

Menorrhagia from the presence of polyp or submucous fibroid is also frequently accompanied by metrorrhagia.

The causes of menorrhagia will be taken up separately during the following pages, where this condition will occupy its proper position as a symptom. The treatment will also be given for the diseases causing this symptom. It differs in these several states and needs no mention here.

In a certain number of cases of menorrhagia the excess is due to impaired general health. The condition is then a symptom of causes other than local. The chief among these general causes of menorrhagia are changes in the condition of the blood. In wasting diseases the blood may be so depleted of its normal constituents as to impair its tendency to form a clot. This is found in the early stages of tubercular disease or in anæmia from any cause. Later, amenorrhœa may result, but during the early stages the menstrual flow may be so abundant or so prolonged as to endanger the patient's life. The blood is thin, and coagula do not form in the bleeding capillaries to stop the period when it should end. In some cases it is the extreme tenuity of the tissues that allows the blood to ooze through. If the blood is thin it will penetrate the thin-walled vessels more easily also. Probably the most important among the wasting diseases that occasionally cause the loss of too much blood at the menstrual period is phthisis. The menorrhagia may be the very first symptom

that is noticed. The early hemorrhage from the lungs themselves is well known and its importance as a diagnostic sign appreciated. The hemorrhage from the womb occurring in quite young women is often of equal importance and should lead to an examination of the chest.

Menorrhagia occasionally accompanies plethora. The tendency of stout women is usually to have too small a flow, but in a few cases they will have an excess at their periods.

Other causes of menorrhagia are purpura, scorbutus, Bright's disease, phosphorus poisoning, and severe jaundice. It may occur as a temporary condition during any of the acute fevers.

Symptoms.—When the patient suffering from menorrhagia is seen first she is usually flowing. These patients rarely consult a physician during the intermenstrual period. The first thing to do is to learn if the amount of loss at the present moment is great enough to require immediate local interference. When it does, the various remedies for hemorrhage of the womb should be used. They will be described later. If the call for local interference is not urgent, an attempt can be made to control the excessive flow by internal remedies. These are frequently efficient, and when they fail it is in many cases due to a failure to use the one indicated. This is a state in which it will not do to rely on routine treatment. It cannot be safely treated as a case of uterine hemorrhage and that only. It must be recognized as a symptom and the cause discovered. Drugs that will control the excessive flow in a pale, thin woman will often be utterly useless in a stout, muscular, full-blooded one.

There are a number of young women who lose too much

blood each month that it will be advisable to try to relieve without an examination. This is particularly true of anæmic, poorly nourished cases. Those patients who have known disease of which menorrhagia is a symptom will be relieved of it as their general health improves.

The Treatment of menorrhagia is with two objects in view. The first is treatment for the immediate hemorrhage when she is seen during the flow. The second is for the removal of the cause, and may go on at the same time as the first, but is more likely to be indicated during the intervals between the periods.

For Immediate Control of the Hemorrhage.—The treatment for the immediate control of a present hemorrhage claims attention first. The patient will be found in bed blanched and weak from the loss of blood. She has all the general symptoms of hemorrhage. It is well to ascertain how many napkins have been soiled and to see the amount passed in the form of clots. If the amount is large and the patient getting weaker, no time should be lost. An examination of the uterus must be made. If there is no evidence of history indicating the presence of retained placental remains or other foreign substance within the uterus, packing of the vagina should be done at once.

Tampons.—The manner of doing this needs some description. In the first place, a douche of water about 115° to 118° F. should be given. Only a few quarts are needed. This will cleanse the vagina of clots and also help to control the hemorrhage, as will be more fully told later. After the douche the patient is made to lie on her side, preferably the left, with the buttocks as near the edge of the bed as pos-

sible. She is instructed to bend up the knees and place the left arm behind her. The right shoulder is then pushed forward as nearly to the bed as possible. This places her as nearly in the Sims' position as is possible. The belt of Cleveland's speculum is then passed over the left shoulder and under the right arm and buckled there. The small strap is passed through the fenestra in one blade of the speculum and passed down the inner side of that blade under the metal band at the junction of the blades and back upon itself. It is thus in position to be drawn and hooked as soon as the speculum is inserted. The free blade is then anointed and inserted in the usual manner of inserting a Sims speculum. After it is in position the strap is drawn taut and one of its many small holes hooked on the point to keep it in position. The patient is now ready for treatment.

After the interior of the vagina has been cleansed with cotton grasped by the dressing forceps, it should be carefully inspected for possible cause of the hemorrhage. If bleeding points are found, a styptic can be applied directly to them. Usually the blood will be seen coming from the external os. If any indication is present, the sound and curette can be used at this time. It is better, however, to give an anæsthetic before doing a curettement. This operation will be described in the pages devoted to metrorrhagia, as will the manner of using the sound and the dangers from its use.

When no indication exists for any interference with the interior of the uterus, the packing of the vagina will be the next step in the treatment. It may be necessary to plug the

cervix first with a cotton tent, but this is seldom done at a first packing.

The cotton tent is made by wrapping a piece of absorbent cotton around an applicator in such a manner as to make a cone-shaped plug. The ordinary uterine applicator can be used for this purpose. A special instrument is made that has a sliding follower on the blade, but it is not necessary and the applicator is always at hand when needed. The size of the tent must vary to suit the canal it is to fit. This can be seen when the cervix is inspected. The cotton tent must be long enough to enter beyond the internal os. A small thread is tied around its outer end by which it may be withdrawn. The tent is inserted with the applicator, which is then removed, leaving the cotton in the uterine canal. It is usually saturated in Monsel's solution of iron before its introduction. Any other astringent may be used, but the iron is probably the best.

After the tent is in place the tampons are to be placed in the vagina. These tampons are usually made of absorbent cotton. The cotton is cut in strips about two and a half inches wide and then rolled into small tight pads. They must not be too large or they cannot be packed in tight enough to prevent leaking. Each tampon is dipped in water containing a few drops of carbolic acid and then squeezed out ready for use. A thread should be looped around the middle of the roll of cotton to hold it in shape. This thread is also a convenience in removing the tampons. It should be double and have a knot at the end forming a loop, by which it can be caught to draw it from the vagina.

In packing the vagina it is best to have a system. The

posterior fornix is the deepest and should receive the first tampon. Others can then be placed in the anterior fornix and then in each lateral fornix. They should be thus placed around the cervix until they reach the level of its end. They must be neatly fitted into the space around the cervix and firmly pressed together so as to make a compact mass. When the level of the cervix is reached it is often well to place a large flat pad of cotton directly over it and then continue with the smaller ones until the entire vagina is filled. When the last tampon is inserted it is held in place with the dressing forceps while the speculum is removed. Care must be taken not to loosen the packing in drawing out the blade.

After the vagina is packed the patient can lie over on the bed and remain perfectly quiet. If the treatment has been done under ether, or if for any other cause she has been placed on a table while it was done, she should be carried back to bed and not allowed to assist herself in any way.

The packing should be inspected in a few hours to see if there has been any leaking of the blood through it. If no blood comes through, it can be left in for one or two days. If no discomfort is caused it had best remain two days. If the evacuation of the bowels or bladder is interfered with, a part of the packing may be removed to diminish the pressure on the rectum and urethra. The latter is more likely to be interfered with.

If there is leakage of blood through the packing it should be removed and a fresh one put in. It may then be necessary to put the cotton tent in the cervix if this had not been done before. If the tent had been used a new and a larger one must now be inserted.

In some cases there will be contraction around the vagina sufficient to expel the entire packing at one effort. This is more liable to happen when the perineal body has been destroyed during a previous childbirth. If the vagina is resistant and shows tendency to contract, sedatives may be given the woman to control the contractions. Valerian, aromatic spirits of ammonia, lavender, or sodium bromide may be of benefit; but more frequently several of these in combination will do better.

When the tampons fail to control the uterine hemorrhage the cervix may be dilated and a gauze packing placed in the uterus. This must be done under ether, and a thorough curettement should be done before the gauze is put in. The strips of antiseptic gauze are then carried to the fundus in loops. The ordinary dressing forceps can be used to introduce it. If there is a curve in the direction of the canal, Bozeman's forceps are better. After the entire cavity of the uterus is filled down to the external os, the vagina should be packed in the same manner as before.

While the gauze is in the uterus the pulse and temperature must be watched, and at the least indication of sepsis it must be removed and the uterine cavity thoroughly cleansed with cotton pads dipped in hot water.

Intra-uterine packing must not be permitted to remain as long as the vaginal packing can be left. Usually twelve hours is as long as is safe. The dangers are from sepsis and from the damming back of blood through the tubes into the peritoneal cavity. Each of these dangers exists with packing of the vagina, but not to the same extent as when the uterus is packed.

In a few cases of uncontrollable hemorrhage the cervix has been temporarily sewed up to prevent the egress of the blood. The pressure of the blood retained in the uterus against the walls causes coagula to form in the bleeding vessels and a clot is also formed within the uterus. The stitches must be removed from the cervix before the sides of the canal grow together. This is an extreme measure and is rarely called for.

When the amount of the hemorrhage is less so that packing is not necessary some of the other means of controlling it can be tried. Several of these may be tried at the same time. Separate consideration will be given each of them.

Hot Douches for Hemorrhage.—Probably the most important of these measures is the use of the hot-water douche. We have seen in the treatment of scanty menstruation that hot water has power to cause contraction of the blood-vessels in the tissues with which it is brought in contact. The hot water acts in precisely the same manner when used for the control of hemorrhage as when used to relieve uterine congestion. Because of the weakness of the patient the amount of water used for hemorrhage is much less than for congestion. Five or six quarts of water at 118° F. is the usual quantity. The hot water must be used in the manner already detailed, but the patient must be moved about as little as possible in doing it. It should be repeated every three hours, and three or four douches should show whether it is going to control the bleeding. If there is not a marked decrease in the amount of blood flow by this time some alum can be added to the last quart of each douche. This should cause considerable improvement when it has been used two or three times. In

using the hot water the skin over which the water flows may be burned. It can be protected by a coat of vaseline. An ointment made of cold cream rubbed up with enough white wax to raise its melting point considerably is even a better protection.

Ice was formerly much used to control hemorrhage, but the hot water has proved so much better that it is now used entirely. Ice-bags to the abdomen, ice-water to the vagina, and pieces of ice introduced into the vagina or even into the uterus were the means of applying the cold most in use. It has been discovered that the vascular contraction induced by heat is more lasting than that from cold. The contractions caused by heat will always respond to the stimulus, while those produced by cold are weaker at each renewal of the application and eventually cease to occur at all. The heat is much pleasanter to the patient than the cold. It does not have the tendency to chill her and congestive inflammations do not follow its use.

Drugs are not to be ignored in the treatment of menorrhagia. They are valuable in many cases during the time of the flow for its control. It is often advisable to use them with the hot water or other local treatment. They act in two ways: by stimulating contractions in the uterine muscle, thus lessening the caliber of the vessels, and by changing the blood itself, causing it to coagulate more readily. Some of the first class of drugs also cause the muscular walls of the vessels to contract and thus lessen their lumen and limit the amount of blood in them.

Ergot is the drug most used to control hemorrhage by causing contraction of the uterine muscles. It is valuable

for this purpose, though it frequently acts to better advantage when combined with others of the same class. When the hemorrhage is due to impaired condition of the muscular coat of the uterus this drug acts best. It is not beneficial when only the endometrium is involved. In cases due to intra-mural fibroid, or when the fibroid is in the transition stage from a mural to a submucous tumor, the effect of ergot is excellent. It is of no value when the bleeding is a result of congestion caused by chronic inflammation in the appendages or in the pelvic peritoneum. The fluid extract is the best form to use, the dose being from twenty drops to a drachm every three or four hours. No benefit is obtained from its use in cases where the hemorrhage is due to impaired condition of the blood.

Hydrastis canadensis is a drug of more recent introduction as a remedy for uterine hemorrhage. It seems to act much as ergot does, but is more satisfactory. Its use is indicated in the same class of cases, and the combination of ergot and hydrastis is often more efficient than either alone. The dose of hydrastis is about the same as that of ergot, the fluid extract of both being most used. If they disagree with the stomach ergotin and hydrastin can be used instead. These are best given in tablet form.

Quinine is a drug that induces contractions in the uterine muscle, and it is an excellent remedy to control hemorrhage. Two or three grains of the sulphate can be given three or four times daily. Its antithermic properties also add to its value for uterine hemorrhage. If it causes no unpleasant head symptoms the dose should be increased to ten grains.

The fluid extract of *hamamelis* has been highly spoken of as a remedy of the same class as ergot and hydrastis. Alone it is a very inferior drug for this purpose, but it seems to aid the two latter drugs in their action. A combination of the three fluid extracts containing twenty minims of each to the teaspoonful can be given every three hours with benefit in the class of cases that respond to these drugs.

The drugs above mentioned act directly on the muscles in the uterine wall. They seem to have a selective action for these tissues. Other drugs act indirectly by stimulating the nervous system. Belladonna or its alkaloid atropine is the most efficient of the drugs that relieve uterine hemorrhage in this way. One two-hundredth of a grain of the sulphate of atropine given three times a day has relieved menorrhagia when ergot, hydrastis, and hot douches had all been used in vain. The second dose can be given in three or four hours after the first.

Full doses of digitalis have been of benefit for menorrhagia when given during the flow. It is indicated when the hemorrhage is a result of venous congestion, especially when the congestion is due to valvular disease of the heart.

Acids.—Among the internal remedies which act on the blood itself the mineral acids are most satisfactory. Dilute sulphuric acid in ten-minim doses largely diluted in water can be given three or four times daily. It is particularly prompt with patients who bleed because the blood fails to form a clot. These women have thin, transparent skin, and too little strength for their ambition. They will frequently say they can feel the "puckering" effect of the medicine generally over the body after taking a few doses.

Any of the other mineral acids may be used in the same way. The dilute sulphuric is probably the best and safest. It is more agreeable to take if combined with cinnamon water. Its use should be kept up for a few days after the flow ceases, or the hemorrhage may return.

A more frequently used but less elegant remedy is gallic acid. It has not been as efficient as the sulphuric in my experience. It is not so pleasant to take. Occasionally it is well to combine the two acids in one mixture, their combined action being better than either in some cases.

Tonics.—Where the menorrhagia is a result of impaired nutrition resulting from overwork, tonics may act promptly enough to stop the flow in a few days. This is more particularly the case when the patient is anæmic. Iron is the tonic most satisfactory in these cases. The best form is the tincture of the chloride. It can be given in ten-drop doses every three hours for a day or more. It must be largely diluted in water to protect the stomach and the teeth. The occasional action of iron in causing hemorrhage must be remembered when using it. Some patients cannot take even a small dose without bleeding from some mucous membrane. The usual result of too large doses of iron is a profuse hemorrhage from the nose, but it may increase the uterine hemorrhage.

Iron is more frequently indicated in anæmic cases to be taken between the periods. It is often advisable to suspend its use during the flow.

Sedatives.—When the menorrhagia is due to accidental causes causing injury or fright, sedatives are indicated. Excessive or violent grief or other emotion and sudden fright

may cause menorrhagia. They are more prone to do so when they occur just before the period should begin. The bromides, opiates, cannabis indica, valerian, lavender, or chloral can be tried, either alone or in combination. When opium is used it must not be continued more than a day or two. Full doses will act better than smaller ones.

Rest.—The last remedy to be mentioned is probably the most important of all. It is rest in bed. The patient must be put to bed at once and made to remain there at least three days after the flow entirely ceases. Reclining on a couch will not do. The clothing must all be removed so that the waist and abdomen is free from all restraining garments. She must lie flat in the bed and keep as nearly absolutely quiet as possible. All remedies used for her relief must be administered with as little disturbance of the patient as can be arranged. She must use a bed-pan to urinate and defecate. If she has to be moved in the bed she must be lifted from one side to the other and not allowed to help herself in any way. She must be raised to put the bed-pan under her and when it is removed. Of course these measures are not indicated in so rigid a degree where there is only an excessive flow each month with no danger from immediate hemorrhage. But even in mild cases it is safest to keep her as quiet as possible until the period is over. Absolute rest in bed for a few months may cure the menorrhagia without other treatment.

Treatment between the Periods.—After the flow at the period, for which the foregoing methods were employed, has ceased, treatment for the condition causing it must be begun. If the patient is a young girl and an examination has not been

had during the flow, none need be made now until an attempt has been made to cure the condition by internal remedies. Iron for the anæmic, poorly nourished patient can now be pushed. Here, as in amenorrhœa from anæmia, Bland's pill is the most satisfactory form in which to administer it. If it does not produce epistaxis or hemorrhage from other than the nasal mucous membrane, it can be pushed. Three five-grain pills after each meal will do wonders in a few weeks. I always order a hundred silver-coated pills at one time. The silver keeps them fresh, while a gelatine-coated pill will get so hard, when old, that it will pass through the entire alimentary canal without being dissolved.

Other tonics, stomachics, plenty of nourishing food, and rest complete the treatment of this class of cases. The rest does much for girls who work or study beyond their strength. The menorrhagia is, in many cases, the result of over-application to study during the girl's school-life. When this is the case books must be eliminated from her routine for a number of months. Exercise in moderation must be taken, and fresh air in abundance must be had during the intervals between the menses. This is really the best kind of rest for the overtaxed brain and nervous system.

If the patient is restless and irritable with sleeplessness she should be given bromides, lavender, or valerian. Opiates and alcoholics should be avoided. Wines are seldom of any benefit, usually doing more harm than good. In deciding as to the advisability of giving anything containing alcohol the fact that this drug is a deoxidizer must be taken into consideration. It can only enter into combination by abstracting oxygen from something in its vicinity. This is

usually the blood of the patient. As these women are already depleted of their oxygen, it is consequently the very thing they should avoid.

When the patient is a married woman, or where other symptoms indicate its necessity, an examination of the uterus should be made about five days after the period is over. If metritis from any cause, or other condition requiring local treatment, be found, it will be given in accordance with the requirements of the case. If nothing except a heavy uterus and congested surrounding tissues be found, the hot douching advised for the congestion of scanty menstruation will be the appropriate treatment. This can be supplemented by the iodine and creosote to the vagina with tampons applied once in five days if required. Intra-uterine applications may be of benefit during the time between the periods. They can be made at every second visit, the vagina only being treated at the other times.

In treating a case of menorrhagia the previous history and habits of the patient must be closely studied, and any unwholesome customs eliminated. If she is too active either with brain or body she must be guarded against the continuance of the habit. If she eats improper food it must be changed. Frequently her surroundings are at fault, and she can only improve by being removed from them.

Metrorrhagia.—When hemorrhage from the uterus occurs between the periods it is called metrorrhagia. As has been said, this symptom is frequently associated with menorrhagia. It may be that the flow is continuous. When this is the case the quantity of blood lost is liable to be more at times than at others. The time of increased flow may coincide with the

menstrual period, or it may have no relation whatever to it. It is common to hear these patients say that they do not know if they have any period or not. When the period does occur, it can be distinguished by the feelings of the patient and by the menstrual odor to the blood.

Causes.—Metrorrhagia is more liable to occur in women past thirty years of age. Its causes are usually grave conditions of the generative organs, and almost always in the uterus itself. The bleeding in some cases comes on after the menopause. The woman will be entirely free from uterine flow for a number of months or years, when it will begin again. The "show" may be a small daily amount, or it may be a loss of considerable quantity at intervals. These old women may feel a disinclination to mention this symptom because of modesty, and thus valuable time be lost. Whenever there are other symptoms in any way suggesting possible uterine involvement uterine hemorrhage should be inquired for.

The causes of metrorrhagia are many of them identical with those of menorrhagia; but local causes are more commonly found for the former than the latter. In nearly fifty per cent of the cases of inter-menstrual hemorrhage some sloughing surface exists at the cervix or within the uterus. The sloughs are the result of cancer, sloughing fibroid, or unhealed laceration, with erosion or hyperplasia of the mucous membrane. Almost all of those cases not accompanied by a break in the mucous membrane are due to metritis from various causes. The most common causes of the metritis are fibroid, subinvolution, and cancer before it reaches the sloughing stage. Metritis from gonorrhœa is rarely a cause of

metrorrhagia. Occasional causes of metrorrhagia are uterine displacements, congestive disease of the pelvic organs adjacent to the uterus, and impaired condition of the blood. The last acts so infrequently as a cause that all others should be eliminated before the bleeding is attributed to it.

All of the above-mentioned causes have received attention elsewhere, and the metrorrhagia has been mentioned as a symptom of each. The treatment has also been given, so that they require but brief mention here. The importance of metrorrhagia as a symptom of serious disease of the uterus will excuse a reiteration of some things covered in the other parts of this volume. Statistics show that more than half of all the cases suffering from metrorrhagia have passed their thirty-fifth year. By far the greatest number of these had cancer or fibroid of the uterus. The necessity that the treatment of both conditions should be begun at the very earliest moment in order to effect a radical cure is the reason for an immediate investigation of the cause of the hemorrhage. The earliest symptom of each of these diseases is hemorrhage, consequently no feelings of modesty should prevent the physician from advising an examination at once. Indeed, so important is this that the physician should impress his patients with its gravity whenever opportunity offers. I believe it is advisable to have all women examined when between the ages of thirty-five and forty. An examination certainly should be made before the menopause.

Abortion as a cause of metrorrhagia remains to be mentioned. Small fragments of placenta remain adherent to the endometrium and prevent contraction of the sinuses that have formed there. At times even the entire placenta re-

mains within the uterus. It may be detached entirely or adherent in part to the uterine wall. In either case hemorrhage results. Rarely the fetus dies in utero, but remains there as a foreign body. The most important symptom is hemorrhage. The fetal envelope may degenerate, forming a uterine mole which may grow indefinitely until removed. The metrorrhagia is the most important symptom. In all cases of foreign body in the cavity of the uterus irregular hemorrhage is the symptom which calls attention to the trouble. It is usually the reason the physician is consulted.

Examination.—When a patient suffering with metrorrhagia is seen the advisability of an immediate examination must be considered first. The remarks already made in describing the treatment of menorrhagia concerning hemorrhage and its immediate control apply here. When the loss of blood is an important factor it must be controlled by the methods there enumerated. Usually nothing is to be gained by postponing the examination of patients suffering with metrorrhagia. There may be intervals when no blood is lost, but they are of uncertain occurrence. Unless the patient is fortunately seen when the symptom is absent nothing is gained by waiting, and valuable time may be lost. The history of the duration of the discharge of blood, its character, and the manner in which the bleeding occurs, will give valuable data to be used with the information gained from the examination. Cases of cancer, fibroid, metritis, subinvolution, or laceration of the cervix will be appreciated and treated as is elsewhere described. Polypi will be discovered and removed. It is when the cause of the hemorrhage is within the uterus that the case needs special consideration here.

The cause in a majority of these cases is the retention of the remains of an interrupted pregnancy. When the death of the fetus is recent the cervix is sometimes sufficiently dilated to admit a sound or even a small wire curette for the purpose of exploring the cavity of the uterus. The touch of the examining finger will discover an absence of cause for the hemorrhage at the cervix. The increased size of the uterus and its heavy, sodden condition will indicate that it contains some foreign body. The size of the cervical canal and the degree to which it can easily be dilated will also be learned at the same time.

Exploration of the Cavity of the Uterus.—When a woman suffering with metrorrhagia is examined and the presence of a foreign body in the uterus made out, the indication is to explore the cavity to ascertain the size and character of the foreign body. If the canal is sufficiently patulous to admit a curette, some of the substance may be removed and its character made out. If doubts exist as to what the removed particles are, microscopic slides should be made and examined. Usually they are of such character that the diagnosis is plain. When it is impossible to remove anything of a character to clear up the diagnosis in this way, aid of the sense of touch may be called for. The finger must be introduced into the uterus and its entire interior surface explored. Thorough dilatation of the entire cervical canal is necessary before this can be done. The canal must be dilated to such an extent that the finger can be introduced to the fundus and have sufficient freedom to be applied in turn to all the endometrium. It must not be hampered by the benumbing effects of a tight ring of muscle contracting upon it at the

internal os. Dilatation of the cervix must also be done when it is so closed and resistant that a curette cannot be introduced. The different methods of dilating the cervical canal will need some description before proceeding further.

Dilatation for the purposes of examination are made in two ways.

Tents of various kinds have been used to dilate the cervical canal, but their use is much less common now than formerly. With the knowledge of the manner of septic invasion came a well-founded fear that the septic inflammation so frequently following their use is caused by the tents. Consequently the most advanced teachers advise this method of divulsion with many precautions, and then only in a limited number of cases.

A brief description of tents and the manner of using them is necessary. They are long narrow cylinders made of some substance that absorbs fluids more or less rapidly and become larger in consequence. They are usually made to taper slightly to aid in their introduction.

The substances most frequently used are sponge, laminaria root, and tupelo.

Sponge tents are rough and consequently more difficult to introduce, but they absorb moisture very rapidly and thus begin to swell sooner and are less liable to be expelled before they tighten than other varieties. They are more appropriate where the canal is already somewhat open. They seem to have a softening effect on the tissues, consequently are the best kind to use where the walls of the canal are rigid and the canal is not small. The sponge tent is more liable to be followed by septic inflammation, probably as a

result of its readiness to absorb the discharges of the vagina and cervix, which may be septic, also because of the difficulty in completely purifying the sponge itself.

The mucous membrane forces itself into the openings of the sponge, and portions of it may be torn off as the tent is removed. The raw surfaces thus left are openings for the possible entrance of septic germs.

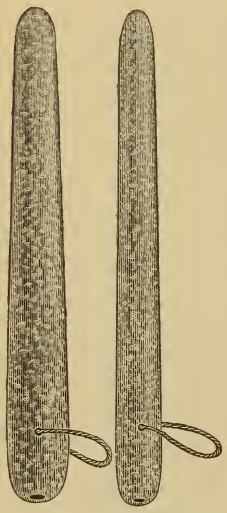

Fig. 27. Straight Sponge Tent, Hollow.

Sponge tents (Fig. 27) are usually bought already prepared for introduction. They should be kept in glass jars with air-tight lids screwed on. Sometimes the physician will find it advisable to prepare his own tents. In this preparation every precaution must be observed as to details, and no possible opportunity for infection allowed.

The sponge should be thoroughly boiled and then washed in a solution of bichloride of mercury, and further manipulations should be done under an antiseptic spray. Before introduction the cervix and its canal and the vagina should be thoroughly cleansed with an antiseptic solution, and douches containing corrosive sublimate should be frequently used while the tent is worn. The vagina should receive special cleansing before it is removed.

Sponge tents are sold in sizes and may be obtained curved (Fig. 28) if the direction of the canal require. They have been in use longer than any other variety.

Laminaria tents are made from the roots of the laminaria

digitata, or sea-tangle (Fig. 29). They are small round cylinders, and absorb liquids rather slowly, but are capable of exerting considerable force. They are more forcible than sponge tents, but do not possess the same power of softening the tissues. The enlargement they produce is not so great,

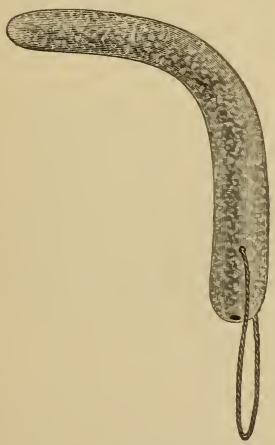

Fig. 28. Sponge Tent, Curved.

Fig. 29. Laminaria Tent.

and they are more liable to be expelled before they have swelled enough to adhere to the tissues. For the same reason they do not absorb the secretions and are consequently less liable to become foul. There is less danger of sepsis from laminaria than sponge tents.

Curved tents can be obtained and should be used if too much force is required to get a straight one introduced.

Laminaria tents should always be tried first because of their greater safety. They will produce dilatation sufficient

for the introduction of an applicator or possibly a small curette, but not sufficient to admit the finger.

The tupelo tents (Fig. 30) are also made from the root of a plant, the nyssa aquatica. They are found in larger sizes than the laminaria and do not dilate with the same amount of force, but they soften the tissues more. They are indicated where the canal is large and a laminaria tent would be liable to be expelled. They may also be used when the smaller variety has been used and the dilatation is not yet

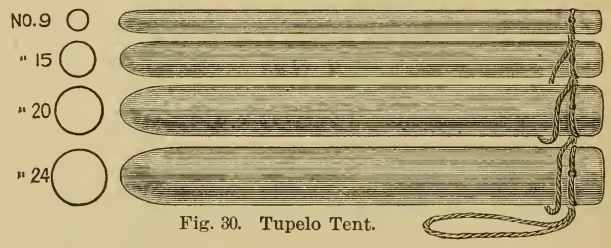

Fig. 30. Tupelo Tent.

enough to permit a digital exploration. This use of a second tent is much more dangerous than the first one and is rarely indicated. A sponge tent should never be used where the use of two is liable to be required, as sepsis is almost certain to follow. The use of gradually increased sizes, forming a set of tents, is advised by a few authorities, but the danger increases with every additional one inserted.

At times the canal at the internal os may be narrower than elsewhere and will admit only one tent. In such a case it may be well to introduce one small one through the inner os and pack as many others around it as can be introduced through the inner os without injury to the canal. These should not form a wedge or cone, or the canal will be unequally dilated. A bundle of small smooth laminaria tents

can be tied together with a very fine thread and introduced all at once, and will often produce a better dilatation than one large tent.

Tents should not be introduced in the physician's office, but at the home of the patient, where she can be put to bed at once and remain quiet while they are left in the canal.

Preparation for the introduction of a tent should be made as for any other operation. A large airy room should be selected, and it should contain little furniture. There should be plenty of light from without, yet the windows must be so protected that inquisitive neighbors cannot look in. The upper halves of the windows give the best light. It is best not to have the sun shine directly into the room. The floor should be perfectly bare and thoroughly scrubbed and dry. If possible, the bed on which the patient is to lie should be in an adjacent room and not in the same room in which the operation is done.

A small table of sufficient strength to bear the patient is needed. One three and a half to four feet long by three feet wide is large enough. It should be covered with a clean blanket, over which a rubber cloth is laid to protect it. These should both be pinned around the table feet so as to hold them in position.

Le Fort dips a laminaria tent into the following solution just before introducing it into the uterine canal. He claims the dilatation will be painless.

℞

Iodoform	ʒ iij
Cocaine pulv	gr. lxxx.
Sulphuric ether	ʒ iij

M.

Rapid divulsion under an anæsthetic seems more scientific and can be done with the entire exclusion of germs. If septic inflammation follow such divulsion with instruments, it is known to be a result of failure on the part of the surgeon in his efforts to prevent the entrance of septic material. Septic fever is a frequent consequence of dilatation with tents, occurring when every precaution seemed to have been taken.

Dilatation of the cervical canal for diagnostic purposes differs in no respect from the same operation when done for stenosis, and has been described in the chapter on the cervix. The patient is placed in the Sims position and Cleveland's speculum used. The anæsthetic is of course given before the patient is placed in position or the speculum introduced. After the cervix is brought into view by the retractor applied to the anterior wall of the vagina, it is caught by a tenacu-

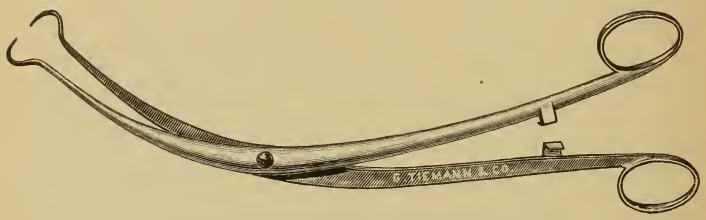

Fig. 31. Skene's Tenaculum Forceps.

lum and drawn down as far as it will readily come. The tenaculum used must be a strong one, or it is even better to use a bullet forceps or double tenaculum. It is very important that the hold on the cervix be a firm one. Many of the inflammations around the uterus that follow operation on that organ result from the jar caused by the slipping of the hold on the cervix. Skene's tenaculum forceps (Fig. 31)

had best be used to steady the cervix; if a good hold be taken it will not slip.

When the cervix is drawn down to an easily accessible position the next step depends on the condition of the canal. If it is so small that only a small sound or a probe can be introduced, Wylie's dilator is used. The Sims dilator may be preferred when the canal is straight, but such is seldom the case. Wylie's modification has a sharper curve in the blades and can be introduced where the Sims instrument can only be passed with a dangerous amount of force. Wylie's instrument can be introduced without difficulty into a straight canal.

Having ascertained the direction of the curve by the examination or the sound, the point of the blades is turned in that direction and the instrument introduced. When the beak has been made to enter the canal until the point is within the internal os, the handles are grasped firmly and compressed. The force used must be a steady continuous pressure. There should be no spasmodic efforts at stretching the canal. It is advisable to dilate in one direction as much as can be safely done, and then allowing the blades to close, to turn the instrument in the canal and dilate in another direction. If several changes in the direction of the force are made, the canal will be more uniformly dilated and a better result obtained. Unless examination with the finger is required the dilating above described will usually suffice. It gives ample room for the use of the curette and the removal of small placental pieces. When the entire placenta or a fetus is within the uterus the more radical divulsion must be done.

The instrument shown in Figure 32 is the best instrument for complete divulsion of the cervix. It is a very powerful instrument, and care must be taken not to lacerate the tissues. When sloughing secundines are present it is very

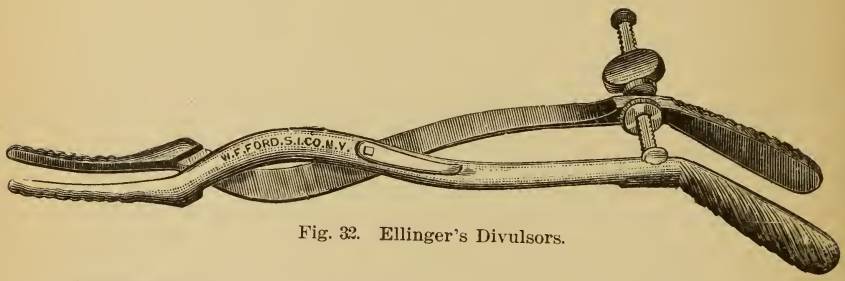

Fig. 32. Ellinger's Divulsors.

desirable not to cause any break in the tissues. The cervix can be dilated without rupture of the mucous membrane. In order that it remain patulous it is necessary to cause parting of the circular muscular fibres surrounding the internal os. If this is not done it will contract in a very short time.

When the canal is dilated and the cause of the uterine enlargement ascertained, the question of treatment must be considered. Usually this question has been decided to the extent of knowing that some foreign substance is within the uterus. In most cases it has also been decided, if found practical, to remove this substance when access to the cavity is attained.

If the substance found in the uterus is a polyp it can be removed in several ways. If the tumor can be engaged in the bite of a Bozeman forceps it may be detached at its pedicle by twisting. If this cannot be done a small flexible wire may be made to surround its attachment and made white-

hot by sending a galvanic current through it. This will remove the polyp. The chain of an ecraseur may be introduced around the pedicle and the tumor removed in that way.

In removing a polyp the important point is to get all of the base of the pedicle. If only a very small piece be left the tumor will grow again.

If a fetus is in the uterus it can be removed with Bozeman's dressing forceps (Fig. 33). A regular placental forceps is made for the purpose of removing the remains of a gestation from the uterus. If at hand, it is very convenient for this purpose. Usually the fetus has been expelled when the case comes to the gynecologist. Placental tissues will be found, or it may be that the entire placenta is yet in the uterus. The forceps are used to remove all the larger frag-

Fig. 33. Bozeman's Dressing Forceps.

ments that are loose in the cavity. After this is done any adhering particles can be skinned off with the finger-nail if the finger has been introduced through the cervix. This also gives the benefit of the direct touch to be sure that all adherent tissue has been removed. For this reason many surgeons prefer the finger to the curette. If the latter instrument is used it should be the dull wire curette shown in Figure 34. This instrument has a small loop, so it can be introduced through a comparatively narrow cervical

canal. It is flexible and can be bent to suit the curve existing in the uterus. It is safe because there is very little danger of cutting through the uterus with it. A sharp curette is seldom indicated in these cases. Its use is more for the removal of hypertrophied tissue or when granular metritis is present. The dull curette must be passed over

Fig. 34. Thomas's Wire Curette.

the entire interior of the uterus to be sure all adhering pieces are removed. The trained hand will soon recognize when the loop passes over a part of the endometrium that is not clean. The peculiar rough sensation transmitted through the handle of the instrument to the hand is unmistakable. Adepts in the use of this instrument will not require any other touch to satisfy them in regard to the condition of membrane gone over.

After the endometrium is entirely freed from all foreign substances it should be wiped over a number of times with absorbent cotton held in the grasp of a dressing forceps. The cotton should be dipped into clean hot water (120° F.) and wrung out until the water remaining in it will not run. A fresh piece should be taken each time the forceps are withdrawn, and the washing should be continued until the cotton is almost free from blood-stain when removed.

After the interior of the uterus is washed out in the manner just described an antiseptic application is made to the endometrium. Carbolic acid, either pure or a fifty-per-cent solution in glycerine, should be used. The applicator

wrapped with a very thin coating of cotton is dipped into the antiseptic and carefully introduced through the cervix. The mucous membrane of the vagina should not be touched with the acid, nor should it come in contact with the external genitalia, as burns result from it which are painful. The entire surface of the mucous membrane lining the interior of the womb should be reached by the applicator.

After the antiseptic has been applied the vagina is cleansed of all blood and detritus and bathed with cotton saturated with hot water. The speculum is then removed and the patient carried to bed.

The *after-treatment* might be summed up in one word, cleanliness. This is secured by attention to details. The bed-linen must be clean, and the moment a part of it is soiled with discharges it must be removed and a clean piece substituted. The same care must be observed in regard to the patient's gowns. A soiled night-dress should be removed at once. The napkins must be changed at short intervals and never allowed to become offensive. The same care must be observed in cleansing the patient's person. The external genitals must be frequently sponged off with warm water containing salol, borax, or the bichloride of mercury. If the mercury is used it should be of a strength of one in ten thousand. No clots of blood must be left adhering to the hair covering the pudenda, and no stains of blood should be left on the skin underlying it.

The vagina must be douched out frequently with boiled water containing some mild antiseptic. Carbolic acid should not be used as a rule. The solution of bichloride used for bathing the external parts can be used for the douche as

well. They should be warm (105° F.), and should be given often enough to prevent any offensive odor appearing in the discharges. Every third hour is the usual time for using the vaginal douche. The quantity of water used at each time should not exceed two quarts, as it is used for cleansing only.

The endometrium will need to be treated after a week or ten days of rest in bed. This treatment will usually consist of application of the tincture of iodine and creosote, applied in the manner described in giving the treatment of metritis. The douches will not be required oftener than three times daily after the patient gets up. She should remain in bed a fortnight. If the metrorrhagia recurs a second curettement may be required, but such is seldom needed when the first one is done with sufficient care and thoroughness.

CHAPTER VI.

DISEASES OF THE VULVA.

THE vulva may be the seat of inflammation, and ulcers may locate here as elsewhere about the genito-urinary tract.

Ulcers.—The favorite locations for cancer or cancroidal ulcers are on the inner surfaces of the labia majora, on the labia minora, or around the fourchette. They are also found in the vestibule and around the clitoris, in the folds of the anus, and on the outer surfaces of the great labia, and may rarely be found high up among the hair covering the mons veneris.

Vulvitis.—Inflammation of the vulva is generally associated with some other diseased condition of the genito-urinary tract. When it exists alone it can frequently be traced to some irritant, as parasites, unclean habits, or gonorrhœal infection, and it may be of diphtheritic origin. In stout persons it may be caused by chafing from exercise in warm weather and perspiration. Vulvitis in very young girls is usually due to want of cleanliness or parasites. When due to want of care in cleansing the parts, the diagnosis is plain, as the evidences of the cause will be apparent at once on inspection. Vulvitis from parasites is common in children. It is usually associated with a vaginitis, due to the same cause. The most frequent cause of this condition is the

oxyurus vermicularis, the common thread-worm. These tiny parasites find little difficulty in traversing the narrow area of the perineum and entering the vagina. This is rendered more easy in small children by the presence of a napkin often wet or soiled. The presence of these parasites in the vagina acts as an irritant, and a purulent vaginitis and vulvitis is the result. The nurse or mother will usually notice this symptom first, and will seek medical advice for it. A careful examination of anus and vulva will usually reveal the cause. The parts are reddened somewhat, and the small threadlike parasites can frequently be seen. There is much itching, and the child, if old enough, will endeavor to scratch or rub the anus or vulva. Sometimes a mass of the parasites will be passed all matted together. The friends may think this purulent discharge is gonorrhœal and fear the child has been outraged. The differential diagnosis is usually easy. Where the child has been mistreated there is usually some evidence of injury and a history of some kind.

Treatment is simple. The removal of the cause is all that is required to effect the cure. Pure aqua calcis injected into the rectum and vagina is the safest and best remedy, and is usually all the local treatment that is needed. Cleanliness must be taught the nurse, and injections of a solution of the tincture of green soap in warm water should be given daily. A dose of castor-oil, followed for a few days by santonin and calomel in small doses three times daily, may be needed to dislodge the parasites from the colon. Any simple treatment, as cold cream, may be applied between the labia, and will be more soothing if a small amount of carbolic acid has

been added to it, enough to secure its anæsthetic effect as well as its antiseptic action. A simple decoction of quassia or aloes is recommended by Bartholow to be injected into the rectum and vagina, after the santonin and calomel have been taken for a day or two. He also advises sponging the folds of anus and vulva with a one-per-cent solution of carbolic acid to remove ova that may be there deposited.

Vulvitis in small children when not due to parasites is frequently of gonorrhœal origin. This is generally acquired indirectly. The manner of contagion is usually from sleeping with some one who has gonorrhœa, or from the use of towels and other toilet articles, or bath-tubs, etc. These cases are acute and chronic, the latter being often very intractable. The vulva must be thoroughly bathed several times daily with a one to two-thousand solution of bichloride of mercury or boracic acid (one to twenty or stronger). After drying, pure powdered salol can be applied freely. If the vagina is involved, small suppositories of salol (one and a half grains) in cocoa-butter (fifteen grains) should be introduced every other day. Injections of warm water saturated with chloride of sodium, carefully made with small syringe, will be found efficacious in cleansing the vagina.

Vulvitis of adults is more frequently due to irritation caused by discharges that bathe the parts, usually a leucorrhœa or abnormal urine. If due to leucorrhœa the treatment of the cause of the leucorrhœa cures the inflamed vulva; as this condition is simply a symptom of that cause existing higher up in the genital tract, it needs no special consideration here.

Vulvitis from abnormal urine is a different matter. The

condition of the urine may be temporary, in which case its correction and cold cream, lead ointment, or cooling washes will be sufficient; but frequently the condition of the urine is the result of chronic disease, as diabetes, chronic nephritis or cystitis, the first being most troublesome because of the pruritis present. The condition of these women is often well-nigh unbearable. The sugar in the urine makes it a constant irritant, and its abundance makes it necessary to void it often. The vestibule and labia are thus brought in frequent contact with this irritating fluid. The resulting inflammation causes swelling, and so enlarges the parts that it soon becomes impossible to urinate without the whole vulva being bathed in urine. The itching present in these cases is the symptom most complained of, and these women are frequently driven almost to desperation by their inability to find relief. The vulvitis from a chronic cystitis and chronic nephritis is not so common, nor are the irritant effects of the urine so great in these conditions. They are much improved if not completely relieved by the administration by the mouth of drugs of sufficient amount and character to make the urine alkaline when voided. The administration of alkalies will not cure the pruritis caused by urine containing sugar. Alkaline urine with sugar is less irritant perhaps than when acid, but the sugar is the cause of the irritation. In diabetes it is often a long time before treatment can remove the sugar from the urine, and sometimes this is not done at all or is only accomplished for a brief space of time. In these cases it will become a question of great importance to the patient what will relieve the vulvitis and resulting pruritis, and that at once. The best

relief will probably come from some ointment. Those hardened by wax to a consistency sufficient to cause the salve to adhere and protect the parts will be found most satisfactory in preventing the urine from causing the itching. The pruritis is best controlled by the following:

℞
Ac. carbol..... ʒ ss
Ung. rosæ..... ℥ ss
M. ft. unguent.
Sig. Apply frequently.

The strength of this ointment (one to eight) causes the anæsthetic action of the carbolic acid to control the itching. I have never seen any unfavorable symptoms arise from it. The danger from absorption is slight, as the mucous membrane and skin are not usually broken, though much inflamed. Its use might be dangerous in cases of advanced nephritis. It is perfectly safe in diabetes. The addition of white wax will sometimes make this ointment more efficient, causing it to adhere longer to the parts because of the increased hardness and greater heat required to melt it. The carbolic acid has been advised to be used in the form of a spray, using force enough to drive the fine particles of the solution deep into the tissues. A ten-per-cent solution is recommended for this purpose. The following can be used locally when the carbolic acid is contra-indicated:

℞
Aluminii nitras..... gr. xxiv
Aq..... ad ℥ iv
M. Sig. Bathe the parts once or twice a day, and use as a vaginal injection.

The alkalinity of the urine can be maintained by the bicarbonate of potassium or sodium, the acetate of potassium, or the double tartrate of potassium and sodium. They seem to act better when given with tincture of hyoscyamus in full dose. The formula usually used by me is:

℞

Tinc. hyoscyam..... ʒ x
Potass. acetat..... ℥ j
Aq. aurant. flor.....ad ℥ iv

M. Sig. ʒ j after each meal in water.

Other Forms of Vulvitis.—Vulvitis due to mechanical irritants or injury only requires a proper attention to cleanliness and the maintenance of an aseptic condition of the parts and removal of the cause. Sometimes the mucous glands are obstructed and a form of acne develops. The vulva appear as if covered with small ulcers more or less thickly scattered over their surfaces. These conditions are not common. They differ from similar inflammatory conditions in mucous membranes elsewhere only because of the irritant effects of urine or leucorrhœa in which they may be bathed.

Treatment.—The granulations must be removed as the first step in the treatment. This is best done by a strong solution of nitrate of silver (ʒ ss to ℥ j), or pure liquid carbolic acid, carefully applied to the granular surface. The labia must be separated by the thumb and finger of the left hand and the acid gently applied on a cotton swab with the right hand. The patient will be saved much discomfort if some vaseline or cold cream is applied between the labia before allowing them to come in contact with each other after making the

application. The patient usually lies on her back when the application is made, and if the acid runs down over the perineum and anus a painful sore may result. This can be prevented by placing a piece of cotton at the perineum to catch any overflow. The after-treatment consists of cleansing the parts frequently, antiseptic injections into the vagina and rest in bed if the vulvitis be severe. The small ulcers will frequently yield to the treatment just described, but when intractable to this treatment it will be necessary to apply solid nitrate of silver or nitric acid to each small ulcer. Care must be taken to destroy each ulcer entirely and yet not to destroy the surrounding healthy tissue. Several sittings may be needed to effect a cure. A spray of cocaine (four-per-cent solution) applied a few minutes before will make this practically a painless operation.

The Bartholinian glands may inflame and suppurate, producing an abscess the size of a pigeon's egg. This is a very painful condition, and may exist a number of days before "breaking." Poulticing to aid the suppuration of the wall may hasten its rupture and expulsion, but less deformity will result and much suffering will be saved the patient if a simple incision is made opening the abscess cavity thoroughly. Its contents should then be thoroughly evacuated and the cavity packed tightly with antiseptic gauze or absorbent cotton, the dressing being changed daily for a week, by which time it will have grown so small as to be practically cured.

Gonorrhœa may cause a chronic inflammation in a Bartholinian duct. In such cases the duct must be laid open and allowed to heal by granulation. The vulva may be the seat

of erysipelas. This usually follows labor, or occurs in infants after the eruptive fevers. Gangrene of the vulva may occur with destruction of the parts.

Cancer of the vulva is occasionally met with, and if found early enough before it has spread to involve other and deeper structures, it should be removed at once. Lupus, elephantiasis, etc., may also occur, but are rare. The vulva may also be involved in irritating skin diseases, as eczema, eczema marginatum, or by pedicli. These all cause pruritis vulvæ and may cause masturbation, the habit being acquired in the efforts to allay the itching by scratching. The unguntum acidi carbolici (ʒ j to ℥ j) will usually suffice to relieve the itching. Hernia into the labium majus may occur. It differs little from hernia in the male, except the presence of the spermatic vessels and chord and the testicles in the latter make it more serious. Hernia into the vulva must be reduced and retained by a truss to avoid danger. If strangulated, the treatment is the same as in the male—reduction under an anæsthetic or operation for its radical cure. Pregnancy will add an additional danger to this condition by causing increased swelling. Varicose veins may occur in either labium majus or both. This condition is usually a result of pregnancy and considerable source of danger from possible rupture, especially at the time of delivery, and it may persist afterward as a chronic condition. A support will often be all the treatment needed, but it may require evacuation of the tumors and ligature of the veins to prevent rupture and dangerous hemorrhage.

The condition of the *clitoris* should always be looked after. This small organ in the female may cause much inconven-

ience, and numerous reflex symptoms have been relieved by treatment of its abnormal conditions. By remembering that this organ is, in the female, the chief seat of sensation in copulation, its importance becomes evident. Like the penis in the male, it has its glands and prepucial covering, and is largely made up of erectile tissue. And like that organ, its prepuce may become adherent to its glands and produce all the train of reflex symptoms physicians are beginning to learn are due to this cause in the male. Smegna will form under the adherent prepuce, and the resulting chalk-like masses form an additional irritation.

The nervous symptoms produced by the adhesions of its prepuce to the clitoris and its consequent irritations are numerous, varying in importance from nervous irritability to epilepsy and paraplegia. Convulsions in young girls are frequently cured by freeing the glands from the adherent prepuce just as they are eradicated by circumcision of the boy. The irritation at the clitoris is also a cause of nymphomania in the female, and its removal will usually cure the habit at once.

While the condition of the clitoris is by no means the only cause of the reflex symptoms mentioned above, it is certainly a cause, and consequently no examination of the genitalia is complete without this small organ is included in it.

The treatment is to free the glands at once. This can usually be done under cocaine, a few minims of a four-per-cent solution injected into the tissues at the base of the clitoris being sufficient to destroy all sensibility. The operation is a small one and can be quickly done, a snip or two with the scissors and separation of the prepuce from the

glands being all that is usually required. When the glands clitoridis have been freed, after-treatment in the form of frequent bathings and packing the space between the glands and the prepuce with absorbent cotton is required for a fortnight or more to prevent the adhesions from forming again. The packings must be continued until the glands begin to be covered with their normal secretion, when the danger of a recurrence is past.

CHAPTER VII.

THE URETHRA AND URINARY MEATUS.

Women often suffer much from very simple ailments. This is in no respect more common than in the diseased conditions of their one or more inches of urethra. The most common diseases here are two: gonorrhœa, and prolapse of the urethral mucous membrane. Other conditions are impaired control of urethra or bladder, non-specific urethritis, etc. But these occur chiefly as symptoms or sequelæ of other conditions.

Prolapse of the mucous membrane of the female is common, and few conditions can cause so much inconvenience from so seemingly trivial a cause. This disease is frequently called urethral caruncle—a condition by no means as common as prolapse. The mucous membrane is turned outward, and its folds form rounded tuberosities which become swelled and inflamed from being irritated by the urine, and often surround the outlet with a fringe of mucous membrane which may extend a half-inch or more beyond the meatus. The gashed appearance presented is peculiar and characteristic, and is caused by parts of the membrane coming down more than the intervening points, making small projections separated by a point that has not become prolapsed.

Symptoms.—A desire to void the urine frequently is a

usual symptom, and these patients suffer greatly from it because they try to retain the urine as long as possible on account of the pain caused by it flowing over the inflamed mucous membrane. The introitus is very sensitive; the least touch to the parts is painful. Coitus is a torture to these patients if they be married women, and a simple digital examination of the vagina or the introduction of a speculum will cause intense pain. There is much burning sensation on urinating, and frequently itching is complained of.

Treatment of prolapse for urethral caruncle must fail to effect a permanent cure. I have seen cases that have been treated either by clipping off the projecting fringe, or burning it off with caustics or cautery. Either plan will give relief lasting for a brief time only. One case treated by clipping several times repeated had almost the entire mucous membrane of the urethra removed. Her urethra was reduced to a short funnel-shaped opening, and was almost devoid of sphincter action. Each operation had removed a portion of the prolapsed membrane, which in about six months was replaced by more sliding down to take its place, to be in turn removed.

Appreciation of the true condition makes the indications for treatment plain. Some plan must be found to draw the mucous membrane back without severing its attachment at the meatus. This is best done by Emmet's button-hole operation, making an artificial opening for the urine further up the urethra in the anterior vaginal wall; one inch from the outlet is sufficient.

The operation can be done with cocaine anæsthesia, unless the patient is very nervous or is one of those few people

who are wanting in susceptibility to the anæsthetic action of this drug.

She should be in the Sims position, the posterior vaginal wall being held away by Sims' or Cleveland's speculum. A sound is passed into the bladder and an incision made down on the sound, beginning within the vagina a half-inch from the meatus and extending upward. The incision must penetrate the urethra, but care must be taken not to wound the mucous membrane of the opposite side.

The urethral mucous membrane is then caught with tenacula through this opening and drawn backward toward the bladder, and is stitched to the vaginal mucous membrane at each side of the new meatus by one or more sutures, and in the upper and lower angles of the cut by one suture at each angle.

Emmet has made a simple instrument for making this artificial opening. It opens as a pair of scissors. One blade is round, to pass into the urethra, and has a fenes-

Fig. 35. Emmet's Urethral Button-hole Scissors.

tra in it. The other has a blade which when closed fits into this fenestra. This cuts the "button-hole" much as the ordinary button-hole scissors are used by a seamstress (see Fig. 35).

This operation creates a fistula connecting the urethra and vagina, but it is seldom that inconvenience is caused by it. In case such result should obtain, the fistulous opening can be closed in the usual way after it has remained long enough for the natural meatus to return to a normal condition due to its freedom from contact with the urine; this usually requires from six months to a year. If the artificial meatus is not made too far within the vagina its closure will rarely be called for.

Stricture of the female urethra is rare and needs little mention here. It can be cured by dilatation or incision, either of which is easy because of the accessibility of the parts. Care must be taken not to destroy the sphincter and cause incontinence. Gradual dilatation with sounds is most satisfactory.

Inability to retain the urine is due to cystitis, stone in the bladder, disease of the cerebro-spinal system, or injury. It may be temporary or permanent, depending on the cause. The majority of these conditions are without the province of this volume, but some of them require brief mention here.

Inability to control the urine from debility of the general system can usually be remedied by tonics, of which strychnine in full doses is the best.

Enuresis in young girls is common, and is not due to debility as a rule. It seems to be a neurosis, and often is difficult to cure. The only history is that the child passes the urine involuntarily when asleep. There is no want of control when awake. These children are often punished for this as a fault. The parents should be told that they cannot be cured in that way. Tincture of belladonna in large doses given on retiring will usually effect a prompt cure. Enough

must be given to dilate the pupils, and it may be necessary to continue its use for a number of months. Atropine sulphate may be used instead, but the tincture has given me the most satisfactory results. If there is any irritation of the parts around the meatus or burning sensations on urinating, the acetate of potassium is added in sufficient amount to make the urine alkaline when voided. The belladonna is usually given in doses much too small to get its best action in these cases. The following prescription is the correct strength for a child of eight years:

℞

Tinc. belladonn. ..... ʒ vj
Tinc. hyoscyam. ..... ʒ ij
Potass. acetat. ..... ℥ j
Tinc. gentian. comp. ..... q. s. ad. ℥ iij

M. Sig. ʒ j after the evening meal in water. Repeat at bedtime if required.

Non-specific Urethritis is not common, and when found is usually accompanied by cystitis or is due to injury. It may be caused by sugar or other irritating substances in the urine. The chief symptom is usually painful micturition, with frequent desire to urinate. Examination will reveal a congested meatus, and the mucous membrane lining the urethra will be seen to be inflamed as far up as it can be exposed to view by separating its walls.

The Treatment consists in removing the cause: curing the cystitis if present, preventing the elimination of sugar or uric acid in diabetes or the rheumatic diathesis, neutralizing hyper-acidity or alkalinity by drugs, and removing stone in the bladder if there be one. If there is a granular condition

of the mucous membrane or chronic hypertrophy an application of nitrate of silver (one to thirty) can be made up to the sphincter of the bladder, or carbolic acid and glycerine, equal parts of each, may be used in the same way.

If chronic cystitis is the cause the bladder may be irrigated with a strong solution of the argentum nitrate and it allowed to flow out per viam naturam. In doing this care must be taken not to destroy the tissues too much, as cicatricial tissue may form, causing contraction and stricture.

Cystitis in the female differs from cystitis in the male chiefly in the accessibility of the bladder to treatment. This accessibility may cause better facilities for acquiring the disease also. This fact is that which calls for mention here. In all manipulations in the genital tract the nearness to the urinary apparatus must be borne in mind, and care must be taken to avoid injury to the meatus, urethra, bladder, or ureters. Septic material may be carried into the bladder by a sound or catheter, and a case of stone in the bladder with a piece of vaseline for a nucleus is on record. This had undoubtedly been introduced with an instrument by a physician. A piece of absorbent cotton was recently removed from the bladder of a patient who had suffered from cystitis for ten years, the first symptoms immediately following a treatment at which an intra-uterine application had been attempted. The presumption is that the meatus was mistaken for the cervix and the cotton from the applicator left within the bladder.

Urethritis in the female has few symptoms compared with this disease in the male; when it does occur it is usually due to infection from a vulvitis or a vulvo-vaginitis, which may

be due to gonorrhœal origin or not. The question of the character of the urethritis is dependent on the character of the inflammation existing in the vulva and vagina, and must be decided from them.

The chief *symptoms* of specific urethritis in the female are ardor urinæ and irritability of the bladder.

On examination a yellowish drop of pus is usually found in the meatus, or, if not present on separating the labia, it can be expressed by inserting the finger within the vagina a short distance and pressing its palmar surface against the anterior wall as it is withdrawn. The vulvo-vaginitis will also be seen on inspection of the parts. Microscopic examination of the pus may be made for gonococci if desired.

Its *treatment* consists of the same internal remedies as are indicated for urethritis in the male; the urine must be kept bland and alkaline or neutral, and cubebs, copaiba, salol, or sandal-wood oil must be given to secure their action, as they are expelled in solution in the urine. The importance of cleanliness of the vulva and vagina to prevent reinfection should not be overlooked, and if indicated the physician can make applications of sulphate of zinc, nitrate of silver, etc., either in the form of an injection that does not enter the bladder, or applied on an applicator wrapped with cotton and introduced to the sphincter, but no farther.

The dependent direction and short length of the canal make the natural tendency of urethritis in the female be toward spontaneous recovery.

CHAPTER VIII.

DISEASES OF THE VAGINA.

The Vagina in its *normal* condition is moistened by a limited amount of *acid* secretion. The walls of the vagina are in contact, the anterior wall resting upon the posterior wall and not forming an open tube, as the illustrations in many well-known anatomies would lead us to think. Figure 36 gives the correct relation of the vaginal walls.

The greatest size of the canal is at its inner and upper end around the cervix uteri, and when not dilated there is only a narrow slit extending from side to side, widening out a little at the cervix. The anterior wall is considerably shorter than the posterior wall.

The redundant mucous membrane lies in folds or wrinkles in the vagina when not dilated, forming rugæ. There are also ridges or ribs caused by elevations and depressions in the membrane itself. When inflated with air or water, or expanded by a speculum, the capacity of the vagina is considerable. The outlet is almost a vertical line, being the narrowest portion of the canal.

The normal mucus is acid in reaction, said to be due to the presence of lactic acid. This acid is claimed by a recent observer to be the result of the presence of large bacilli—the normal bacilli of the vagina. The bacilli are always found

in normal vaginal discharges and are absent in diseased discharges. It is supposed the lactic acid is poisonous to the pathological germs, and it is only when the pathological

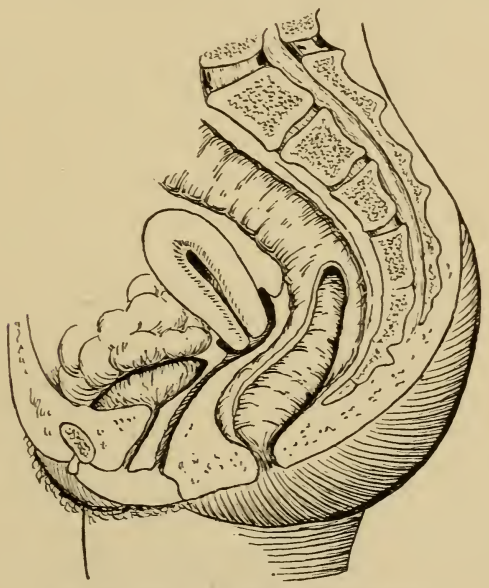

Fig. 36. Correct Position of the Vagina.

bacilli are in great enough quantity to destroy the normal vaginal germs that a diseased condition results from their presence.

Abnormalities.—The vagina may be abnormal in shape or size, or it may be wanting in part or entirely. These abnormal conditions may be the result of injury or disease, but are usually congenital. Absence of vagina is not to be distinguished from closure of the genital canal from other cause until an examination is made. Closure of the genital canal is called atresia. The symptoms of atresia are the

same, no matter if the occlusion be at the cervix or the hymen or due to entire absence of the canal.

Imperforate Hymen is rarely discovered until puberty. Then all the initial symptoms of the awakening function appear. The breasts enlarge, the voice deepens, and the bust and hips develop; the symptoms are followed by pains in the

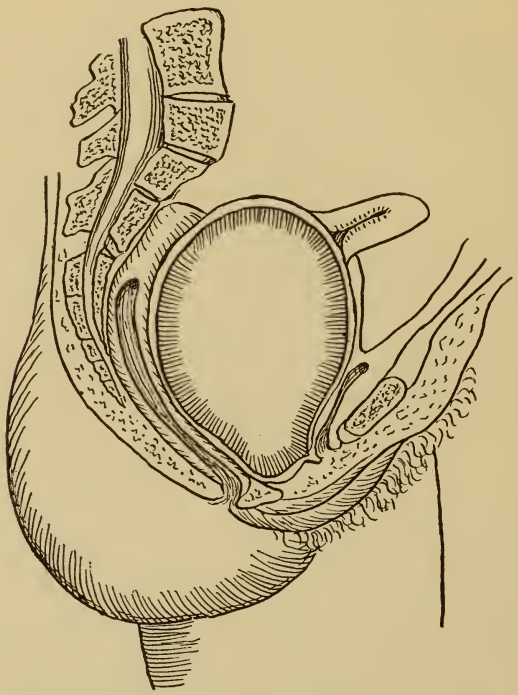

Fig. 37. Imperforate Hymen, Vagina Largely Distended.

back and pelvis, and later on by flushing of the face, headache, and general malaise and perhaps some fever. These latter symptoms will subside in a few days, leaving the patient comfortable for a month or more, when they recur with

greater intensity. She has all the feelings due to normal menstruation, and often more pain, and to these are added the symptoms due to retention of the menstrual blood, and there is no "show." The flow does not appear externally. This may go on for a number of months before a physician is consulted.

There is little difficulty in making a diagnosis of retention somewhere from the symptoms. The patient will never have menstruated, but will have the molimen menstruale to distinguish her condition from amenorrhœa due to late development. One very prominent symptom found when the atresia is at the hymen is inability to retain the urine for any considerable time, recurring every month for a few days and then disappearing until the time for the next period arrives. This is due to the pressure on the bladder of the retained blood in the vagina. Figure 37 is a drawing taken from a case in which the vagina was largely distended.

If the retention is due to an imperforate hymen this membrane will be seen at once on parting the labia majora. It may even bulge out as a tumor, the whole vagina and uterus being dilated so as to form one canal filled with dark grumous fluid. It may go back through the Fallopian tubes into the general peritoneal cavity, causing a peritonitis. This complication is rare, as the cause is usually found and removed before the blood accumulates in sufficient quantity to cause it.

The Treatment of atresia at the hymen is plain, but must be carefully done. The imperforate hymen must be opened. Some authorities advise making a very small opening and allowing the accumulated blood to gradually ooze away.

They claim to thus avoid all danger from the entrance of septic germs. The condition within is most favorable for acquiring sepsis, and whatever course is pursued must be accompanied by the most rigid antisepsis. The more radical method is to operate, either with or without anæsthesia, and drain off the retained fluid at once, taking every precaution to avoid the entrance of poisonous germs. This operation is simple. The hymen is perforated and snipped away with scissors. If it is very thick and resistant it is best to remove the entire membrane. After the fluid has drained away a douche of some antiseptic solution should be given. Bichloride of mercury one to six thousand is probably the best and safest solution for douches. Permanganate of potassium is free from danger from absorption. Carbolic acid is not safe because of probably being absorbed. The greatest care must be taken to provide for thorough drainage, as very serious consequences are sure to follow if any of the fluid is retained anywhere within the canal. The shock of too sudden removal of retained blood is also to be guarded against if the retention is of long standing.

Atresia.—The retention of blood may be due to an *atresia* of the vagina anywhere along its canal. In these cases it may not be easy to make out if a uterus is present or not. Examination by the rectum will sometimes reveal that organ if present. If the appendages are active and the uterus is filled with dammed-up menstrual blood, its normal outlines may be so obliterated as to make it impossible to decide if it is a uterus or a tumor. The operation to make the vagina patulous will be required if the ovarian function is active.

Congenital atresia without symptoms may exist, the uterus or ovaries being absent or inactive. In these cases no operative interference is indicated as a rule. Where the woman has married in ignorance of her inability to have the marriage consummated, an artificial vagina has been successfully made. But such operations are seldom required, and their wisdom is questionable.

If the menstrual function exists, an opening must be made for the exit of the blood, great care being required to avoid cutting into the bladder or rectum. The peritoneum may extend far down into the pelvis, and care must be taken to avoid cutting it.

After the artificial canal is made glass tubes must be worn for months to keep it from contracting. A quasi-mucous membrane will form in time, lining the artificial vagina, and then it may remain patulous. But it needs watching, and the least tendency to contract must be combated by the daily introduction of the tube.

Acquired atresia is usually from injury or disease. Its causes are contraction of cicatricial tissue, the result of healing tears received in childbirth or from other injury, or from ulceration. Very hot douches may scald the mucous membrane, and the scars contracting will narrow the canal, but complete closure is rare for this cause. The raw surfaces may adhere in healing.

Many cases of multipara are met with that have "bands" in the vagina. These may be simply a thickening of the vaginal wall at one side, causing a ridge to be felt there, or they may be so extensive as to almost close the canal. These bands usually run from the cervix, and are due to tears of

that part which have been so deep as to involve the vagina itself.

Rarely the vagina is torn in this way when the cervix is entire. The wall has been torn by the introduction of a hand into the vagina (Tait) or by rough coitus. The usual cause is childbirth. The symptoms of acquired narrowing of the genital canal are dependent on the amount of contraction. If there is complete atresia there will be suppression of the menstrual flow. This must be differentiated from stoppage of this function from other causes. Pregnancy may be present, but can almost always be distinguished by associated symptoms. Cessation of the menstrual flow from wasting disease will be easily distinguished by the symptoms of that condition. The presence of all the symptoms of a normal menstruation without external evidence is the most significant symptom of complete acquired atresia, and demands an examination.

The Symptoms of narrowing of the vagina are not many or characteristic. The chief cause of complaint will be the pain produced by the entrance of anything into the vagina. If the constriction is considerable coitus may be impossible. The introduction of a syringe tip or the examining finger will also cause pain.

The usual position of acquired constriction is somewhere in the vagina. There may also be partial closing of the uterus. This is usually at or near the internal os, and will receive attention as stenosis. The most marked symptom is dysmenorrhœa. This is often a congenital condition, but may be acquired.

The proper *treatment* is dilatation, and can be done rapidly

or gradually. Rapid dilatation must be done under anæsthesia. The pressure had best be applied laterally and with the thumbs, and should be forcible enough to cause the constrictions to break. They can be felt as they give way. No

Fig. 38. Glass Tube (Vaginal).

break in the mucous membrane should result. A glass tube (Fig. 38) should then be inserted and worn constantly for several days, and then gradually dispensed with in about two months or more.

Dilatation may also be done gradually, either by wearing vaginal tubes or by tampons. The tubes are introduced first by the physician, and then by the patient at her home, and are worn for a half-hour or more each day. After a time a larger tube is used until the constriction is cured.

The tampons are applied around the vagina until it is filled, and are worn twenty-four hours unless they give pain, when they should be removed by the patient, who should be instructed to take out one or all when the pain becomes severe. They must be applied every third day and their use continued for several months. The vagina should be painted with tincture of iodine and creosote before each treatment, and the tampons saturated with boro-glycerine solution before introduction. Absorbent wool may be used instead of cotton, as it is more elastic.

Vaginismus is a spasmodic contraction generally due to a state of hyper-asthesia of the introitus. It is met with in nervous women. There is no real narrowing of the canal, but simply a spasm of muscles whenever an effort is made to introduce anything into it. The spasm may come on at other times, being excited by cold, nervous excitement, constipation, etc. It may be so severe as to cause the patient to go to bed from the paroxysms of pain, which are usually of short duration but may recur at frequent intervals. It may be impossible to introduce a finger into the vagina at all, or even the tube of a small syringe, yet when the patient is put under an anæsthetic the vagina will admit a large speculum without any difficulty. If found in married women there is much pain caused by any attempts at coitus, which may be rendered impossible by it. The closure may be only a temporary spasm, which yields in a few seconds, leaving the parts relaxed and allowing the act to be performed without further interference. The last-mentioned condition is usually caused by contraction of the voluntary muscles around the vaginal outlet, the perineum being drawn forward in a marked degree. This contraction only lasts until an entrance is effected, and occurs every time an attempt is made to introduce a speculum or anything else into the vagina.

The Treatment consists in allaying the hyper-æsthetic condition of the nervous system and building up the general health by tonics and exercise, with suitable intervals for rest when needed. The local condition must also be attended to. A vaginal tube must be introduced and worn a part of each day for a long time, until all evidence of spasm has disap-

peared. It is frequently necessary to use ether to make the examination, and it is also needed to get the tube in place the first few times. When an examination can be made without an anæsthetic the finger in the vagina will notice

Fig. 39. Bozeman's Vaginal Dilator.

the firm contractions of the muscles closing upon it. This is a very characteristic sign of vaginismus, as it is noticed in no other vaginal disease. When the vaginal tube has been introduced it is best to have it worn for several days

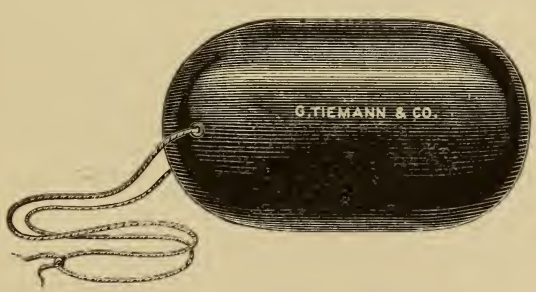

Fig. 40. Bozeman's Vaginal Dilator.

before removal, after which time it can be replaced without the anæsthetic. It should then be worn a part of each day until a cure is effected. Figures 39 and 40 are vaginal dila-

tors made from hard rubber. They are less liable to break than the glass instrument.

The *medicinal* treatment usually calls for large doses of iron with strychnine and quinine, if indicated. It may be necessary to give the bromides or asafetida; the bromide of soda in ten-grain doses will often produce excellent results; tincture of castor fiber may be of benefit where the bromide fails. In fact, the treatment may be summed up by saying, put the patient in the best general health possible.

Care must be taken to keep these hyper-æsthetic patients from the use of opium or alcohol, as there is much danger to them in these drugs, and their use once begun is often difficult to keep under control. They are the type to whom these drugs are most liable to be injurious and whose danger from habit is greatest. There are many women who resort to some alcoholic whenever they have pain in or about their genito-urinary organs. If taken in large enough quantities they may find temporary relief in this way, but in the end the effects on the general system will be demoralizing. The custom should be condemned by every physician.

Vaginitis.—Inflammation of the vagina is chiefly of two kinds, specific (gonorrhœal) and non-specific. Either of these may be acute or chronic, the latter form usually, if not always, being a sequence of the former.

Gonorrhœal vaginitis is very common. This does not mean that so many women have acquired it in a manner that would reflect in any respect upon them. It does mean that many men, especially in cities, have at some time had gonorrhœa. A prominent specialist in venereal diseases of men stated recently that as many as ninety-five per cent of

all the men in a community had gonorrhœa some time during their lives. This may be a high estimate, but it becomes a very serious question for the gynecologist when considered in conjunction with what another equally well-known specialist in venereal diseases (Fox) has said in regard to its cure. He said: "I am convinced that few men who have had a gonorrhœa extending to the deeper portions of the urethra ever get so completely cured as to be sure there is no risk in conveying the contagion to their wives." A few pus cells bearing gonococci may be dislodged from any of the smaller ducts opening into the urethra. This comes in contact with a mucous membrane that is fresh ground for its spreading, and gonorrhœal vaginitis is the result; his own urethral mucous membrane resisting the contagion from acquired immunity. The physician should bear in mind this possible means of contagion, as it may enable him to allay suspicions that would cause doubts on the part of both husband and wife, while each may be innocent of marital unfaithfulness. But it also shows that few women are free from risks of possible contagion.

The Symptoms of acute gonorrhœa in the female present a well-marked picture. There is heat and burning sensations, with much sensitiveness of the vagina. The entrance of a small speculum or an examining finger causes great pain. There is purulent, creamy discharge, which is usually abundant, and when the urethra is involved frequent desire to urinate with painful micturition is added. If the vulva becomes inflamed the contact of the urine will cause smarting in addition to the burning sensation, due to the inflamed condition. The inflamed labia will also cause pain from

their contact with each other, and more or less swelling is present. The chief object of internal medication for gonorrhœa in the female is to keep the kidneys well acting, and to make the urine hyper-alkaline and consequently bland and non-irritating. Also to allay the irritability of the bladder and its sphincter, which causes the frequent desire to urinate.

The following prescription has usually answered all these requirements:

℞

Tinctur. hyoscyam.....	ʒ j
Potass. acetat.....	ʒ vj
Tinc. gentian. comp.....	ad ʒ vj

M. Sig. ʒ ij three times daily, in half a glass of water.

Alkaline waters should be used abundantly, and all forms of alcohol prohibited. Quiet in bed is necessary, and a limited diet should be given.

The *local treatment* is of the utmost importance. This consists of thorough and frequent vaginal douches. It is necessary that these be given with the patient in the dorsal position. They should be copious, a half-gallon or more, and hot; 110° to 118° F. is the proper temperature. They should be taken every two or three hours.

Many drugs have been recommended to be given in these douches. The most prominent is probably bichloride of mercury, in strength varying from one to two thousand to one to ten thousand. Acidi carbolic. (one to forty) is frequently advised. Salol (one to forty) is growing in recent favor. Borax or boracic acid is frequently given. These are all good, and usually will be found efficient. The remedy most convenient and at the same time thoroughly satis-

factory is common salt (sodium chloride), a tablespoonful or more to a gallon of water being the best proportion. This has the merit of being easily accessible, is entirely free from danger, and is very efficient.

When the painful stage of the acute vaginitis has been somewhat allayed by the douches, some application is needed to the inflamed mucous membrane that is in a more concentrated form than above advised. These stronger applications must be made by the physician and not trusted to the patient. The best remedy is nitrate of silver; the solution should contain a drachm to an ounce of water, and it should be kept in a dark bottle. The entire area of the involved mucous membrane should be thoroughly covered with the solution. It is best applied with a small ball of cotton grasped in the jaws of a long narrow dressing forceps, and can be applied either with Sims' or a bivalve speculum. Pure tincture of iodine is frequently used in the same way but is not as satisfactory as the nitrate of silver.

Non-specific *causes* of vaginitis are metritis, excessive coitus, dysentery, diphtheria, the exanthemata causing usually an erysipelatous form, and parasites from the rectum. I have seen cases due to the invasion of the vagina by parasitic skin disease, tinia versicolor, eczema, etc.

It may be impossible to distinguish a vaginitis of non-specific origin from one due to gonorrhœa, so a guarded statement is always safest in assigning a cause.

Acute vaginitis (non-specific) is accompanied by pain in the vagina, which is described as of a "burning" character. There are burning sensations on urinating, and frequent micturition if the meatus and urethra are involved; tenes-

mus of bladder and rectum are common. Leucorrhœa is almost always present; it may be of a thick creamy character, or it may be white and thin in consistency, like skimmed milk or whey, and is rarely tinged with blood; if it contain much pus it will have a greenish tinge. The leucorrhœa may be irritant, involving the vulva and even the skin over the thighs for considerable distance in an inflammation caused by being bathed in it.

Inspection reveals the vulvitis, if present, by the swelling of the labia. On separating the inner surfaces the lower end of the vagina may be seen red and swelled with inflammation and bathed in leucorrhœa. There is usually much tenderness, and considerable pain is complained of from the introduction of the examining finger or speculum. The latter will reveal the inflamed condition of all parts of the mucous membrane, extending over the whole vagina and the vaginal portion of the cervix, and at times extending within the cervix, involving its interior mucous membrane.

The Treatment is the same as has been given for the specific form.

Chronic vaginitis may be a sequence of the acute form, but is frequently chronic from the beginning. It is often gonorrhœal when following an acute attack, but the idiopathic chronic form is usually a sequence of metritis located at the cervix. The *symptoms* are not so severe as in the acute form, the pain is less or may be entirely absent, the tenesmus is less or none, and the urinary involvement has usually passed away. The leucorrhœa is thinner, unless from uterine or tubal involvement, when it may be thick and ropy; but it is seldom irritating, and there is little if any

tenderness on manipulating the parts. Vaginitis of non-specific origin is less likely to cause complicating metritis and salpingitis than that due to gonorrhœal infection.

There is also a form of *follicular vaginitis* occasionally met with. It is non-specific, and its cause is unknown. The inflamed points are easily made to bleed by rubbing off the epithelicar cells, which form but a thin layer at these points. The vagina may be covered with small ulcers resulting from the breaking down of the follicles. This is a condition rarely found. It may be confined to the cervix, or it may be an extension inward of follicular vulvitis.

Treatment of chronic vaginitis is much the same whatever its cause. The folds of the mucous membrane must be carefully reached. This is best done with copious douches taken with the patient in the dorsal position. After thorough cleansing with the antiseptic douches local applications must be made. This is usually done with Cleveland's speculum, as less of the mucous membrane is covered by the instrument, but can be very thoroughly done with a bivalve. In using the latter the blades should be held apart as it is withdrawn, and the anterior and the posterior vaginal walls treated as they come in view by slipping over their tips; in this manner the whole of the membrane can easily be treated. The strong solution of the nitrate of silver is the best remedy to paint the vagina with, a solution containing from a half-drachm to a drachm of the silver to an ounce of distilled water being most frequently used. Pure tincture of iodine will also produce good results.

Engleman advises what he calls the "dry method" of treating chronic vaginitis. He applies remedies directly to

the mucous membrane in the form of powder. These can be blown in through a speculum but are generally applied on a tampon. These tampons are saturated with boroglycerine and then covered with equal parts of the subnitrate of bismuth and powdered chalk. These are left in the vagina for from twelve to twenty-four hours. Iodoform can be added to the powder if its use is indicated. An occasional douche is also required to wash out the vagina; it may be of plain hot water or medicated, as seems called for by the condition present.

Salol is one of the newer remedies for vaginitis, and can be used pure in powdered form or in a suppository containing two or three grains of salol to fifteen grains of cocoa-butter. It can be applied every other day.

Powders containing calomel will sometimes cure an inflamed vagina that has proven intractable to other remedies. The corrosive chloride of mercury can also be used, from one twentieth to one thirtieth of a grain being mixed with fifteen grains of the oil of theobroma and applied as a suppository every third or fourth day.

Of equal importance with the applications made directly to the mucous membrane by the physician are the applications to be made in the form of douches. These must be taken in the thorough manner elsewhere described. The importance of taking douches correctly cannot be too emphatically impressed.

Douches.—There are many excellent formulæ for vaginal douches. The most used is probably a solution of borax or boracic acid. Either of these may be used in solutions containing an ounce or less to the pint, or even stronger. An

ounce or more of sodium chloride in a pint of water makes a most satisfactory solution for vaginal irrigation. This is especially good for chronic vaginitis of gonorrhœal origin. If there is no involvement of the uterine mucous membrane it alone will cure many cases. Its accessibility is an added advantage. Where astringent action is needed alum can be added to one of the above solutions, a half-drachm to the quart being the proportion most used. Where it is deemed best to act directly on the mucous membrane by the douches, the sulphate of zinc can be used, in the proportion of from fifteen to twenty grains to a quart of water, or the fluid extract of hydrastis may be used, either alone or with one or two grains of nitrate of silver to every ounce of hydrastis. The sulphate of zinc can also be used in this fluid extract. Carbolic acid is frequently used, in strength of ten to twenty drops to each quart of water. Its use is contra-indicated where there is extensive erosion about the cervix or recent laceration of considerable extent. This drug is especially dangerous when lesion of the kidneys exists. It is never safe to advise a patient to use "a little carbolic acid" in any application to a mucous membrane. The dangers from absorption are genuine. If any one doubts it let him give a small dog a bath in a solution of carbolic acid and see how quickly he can kill it.

Many vegetable substances have been used as ingredients of vaginal douches. The fluid extract of hydrastis has been mentioned. The infusion of quassia or of white-oak bark were formerly in high repute. Tannin is also frequently advised.

Injections of lactic acid have been suggested to restore

the mucous membrane to its normal state, by destroying the pathogenitic bacilli, and at the same time furnishing a favorable environment for the large bacilli of the healthy vagina.

A solution of mercuric chloride, about one to four thousand, is a good antiseptic douche when indicated.

Plain hot water (110° to 118° F.) is an excellent remedy for vaginitis, especially where there is much inflammation, the hot water causing anæmia of the mucous membrane lasting a number of hours by contraction of the arterial walls it induces. These copious hot douches should be used in all pelvic diseases where it is desirable to counteract congestion or too free blood-supply to the parts.

The most satisfactory method is to thoroughly paint the whole vagina with the nitrate-of-silver solution, and have copious douches of hot water and salt taken every three hours. It may be necessary to apply the silver a second time, but rarely oftener if the previous applications have reached the whole of the involved mucous membrane.

CHAPTER IX.

CERVIX UTERI.

The Uterine Cervix is probably more frequently the seat of disease than any other part of the parturient canal. A thorough knowledge of its normal condition and of the abnormal changes found in it is essential. This chapter will consider those conditions of cervical disease in which inflammation is not an essential factor. The diseases that are associated with inflammation are described in the chapter on metritis.

The Normal Cervix is felt as a round projection extending downward from the anterior wall of the vagina. Its walls are round, smooth, and continuous, and it points toward the anus. If the uterus is in normal position the cervical canal lies in a line from the umbilicus to the anus. The small rounded depression of the external os can be felt in the end of the cervix as a dimple. It should be round, smooth, and entire in the nulliparous uterus, while the opening is slightly oval in multipara, when no laceration exists.

The posterior wall of the cervix is longer than the anterior wall because of the greater depth of the vagina at the part under the cul-de-sac of Douglas. In the adult female the cervix projects into the vagina about three fourths of an inch on its anterior wall and one inch on its posterior wall. It

must be borne in mind that this is only an approximation, as there is a normal variation in this respect as in the length of noses.

The examining finger must note the consistency of the cervix—if it is too hard or too soft. Its mobility and direction are at the same time ascertained and the relation to surrounding organs. Any break in the continuity of the rounded outline will also be perceived.

The principal abnormalities of the cervix that call for special mention here are stenosis, atresia, hypertrophy, and atrophy; the most common of these is probably stenosis.

Stenosis.—By stenosis of the cervix uteri is meant a narrowing of the lumen of the cervix, which may be at any point in the canal. The entire canal may be involved in this way, but the usual position is at the internal os. More rarely the constriction is at the external os.

Stenosis may be congenital or acquired. The *congenital* form is a result of mal-development and is frequently associated with congenital anteflexion. Women with this form of stenosis usually belong to one of two types which are really varieties of the same type. The first of these is anæmic, poorly nourished, afflicted with "nerves," a poor or capricious appetite, and has usually more energy than endurance; the other is also anæmic, but usually stout and sluggish, having little energy, and claims to eat very little. Both varieties suffer from constipation, anæmia, scanty or absent menstruation, dysmenorrhœa, and leucorrhœa, and if the patient is married dyspareunia and sterility are usual symptoms.

Constipation and anæmia are almost invariable accompaniments of congenital stenosis. They will both be considered

more fully elsewhere. The scanty or absent menstruation results from the anæmia and is due to the same causes. The *dysmenorrhœa* that frequently accompanies stenosis is characteristic. The pain begins during the first day of the flow and generally before it appears, and lasts a variable time. It may cease altogether when the flow is well established, or it may last during the whole period. It is usually paroxysmal, resembling labor pains, and the paroxysm frequently ends with the passage of a clot of blood. The pain is evidently a result of uterine contraction stimulated by the presence of the menstrual blood in the uterus. The first clot may dilate the canal to such an extent as to allow free exit for the remainder of that "period," or it may contract at once, requiring fresh contractions to expel the accumulation of the next few hours. This causes recurring paroxysms of pain lasting until the flow is over.

The leucorrhœa is generally due to cervical catarrh and is pale, thin, and scanty. In a woman who has not borne children, who suffers from dysmenorrhœa, intra-menstrual leucorrhœa, and sterility if married, the length of the cervix becomes important. It is frequent to find a long conical cervix in these cases. The long cervix is a very common accompaniment of congenital stenosis.

Treatment for the stenosis and accompanying anteflexion frequently fails to relieve the sterility because the abnormally long cervix as a factor in causing it is overlooked. The dysmenorrhœa may be relieved, the leucorrhœa may disappear, but the woman does not become pregnant. If a portion of the long cervix is now amputated she usually becomes pregnant in a few months.

The condition of the cervix is usually typical. The vaginal portion is generally elongated, and frequently pointed, with a "pin-hole" os in its extremity. The examining finger will detect the zone of unyielding tissue in the neighborhood of the internal os. The anteflexion, usually present, will be noted at the same time. The resistance given to attempts to pass a uterine probe will establish the diagnosis.

Acquired Stenosis of the cervix is almost invariably caused by cicatricial tissue. It is usually the result of injury received in parturition, the interior of the canal being denuded of its mucous membrane as a result of extensive bruising and consequent sloughing. The contraction of healing lacerations may also restrict the lumen of the cervix. The canal has been left too small as a result of operation to repair laceration of the cervix, the result being an artificial stenosis. Stenosis may result from the formation of fibrous tissue in the cervix. The canal may be narrowed by pressure from tumors either in the cervical portion of the uterus or in the adjacent tissues.

There is no peculiarity of type of patients suffering from acquired stenosis. Symptoms may be entirely absent, but dysmenorrhœa is frequent and leucorrhœa is common. This form of stenosis is more frequently accompanied by metritis, although uterine inflammation is common with the congenital variety. The metritis involves the entire endometrium but is usually more localized in the mucous membrane of the body.

The diagnosis is established by the examination per vaginum and by the probe. Touch will also reveal the laceration, cicatricial tissue, or other etiological conditions present.

The Treatment of stenosis of the cervix is chiefly mechanical. The canal must be forcibly divulsed. The methods of divulsion of the stenosed cervical canal may be classed as gradual and rapid. The former method is held more in favor by non-surgical gynecologists; the latter is the favorite of most surgeons. Gradual divulsion is done at repeated treatments by graduated dilators which come in sets, the best being Hank's (see Fig. 41). Peaslee's dilators also come in sets (Fig. 42) and are used in the same way. The method is to pass one or more of the smaller sizes at the first treatment, as large an instrument being used as can be borne without causing too much pain, and then to use larger sizes at the next visit and increase until the required degree of enlargement of the canal is attained. This will usually take a number of visits. A too forcible treatment may set up so much irritation around the cervix or uterus as to make it necessary to confine every

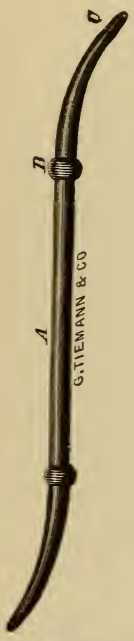

Fig. 41. Hank's Uterine Dilator.

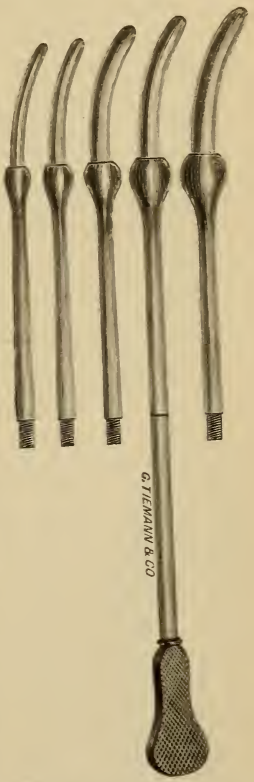

Fig. 42. Set of Peaslee's Uterine Dilators.

other visit to vaginal applications and the tampons, using the dilators only every second or third visit. It may be necessary to steady the cervix with a tenaculum while introducing the dilators. After the dilators have been passed each time, a small applicator should be well wrapped with absorbent cotton and an application of some counter-irritant made to the endometrium. The best is tincture of iodine and creosote (beechwood), equal parts of each. Equal parts of carbolic acid and glycerine is also very good. After the intra-uterine application is made, the tampons must be applied to the vagina in the manner already described.

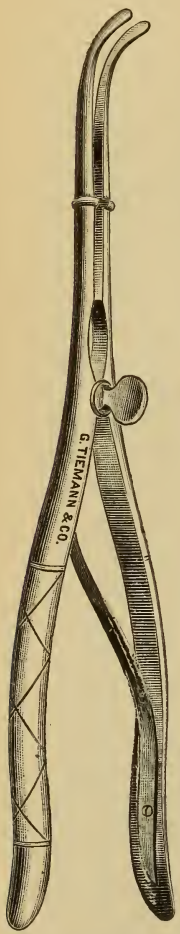

Fig. 43. Wylie's Uterine Dilator.

Rapid divulsion must

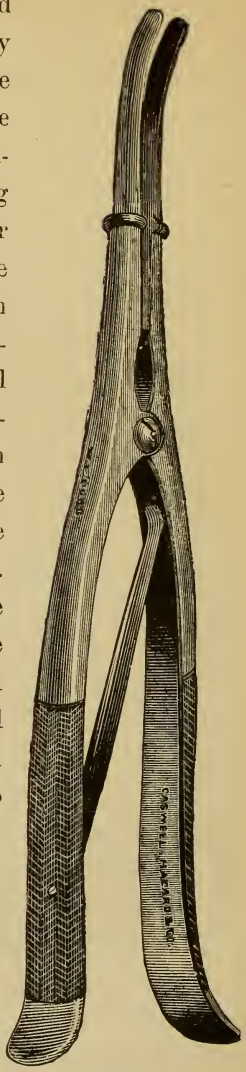

Fig. 44. Sims' Uterine Dilator.

be made under anæsthesia. Tait uses his graduated dilators, passing size after size, until the divulsion is complete, at one sitting. Divulsors are more frequently used which enlarge the canal by opening the blades of the instrument while in the canal. Wylie's is most used in New York (see Fig. 43). The sharp angle in the blades makes this instrument better than others. This curve makes the introduction of the instrument easier when much flexion is present. A larger instrument should be at hand, capable of exercising more force than Wylie's will bear, as cases are met that will contract at once unless a more powerful instrument is used. Sims' dilator has heavier blades (Fig. 44), and can be used after Wylie's has made the canal large enough to admit it. But more satisfaction will arise from using Ellinger's divulsor (Fig. 32, page 142). This is a cleaner instrument than Goodell's and as strong. In order to get a good result the circular muscular fibers around the internal os must be broken thoroughly. They can be felt as they separate. Sudden efforts must be avoided, or extensive laceration may be caused by the exercise of too much force impulsively applied. The divulsion can be completed without breaking the mucous membrane and should be, as less cicatricial tissue results, consequently the stenosis is less liable to recur. The danger of infection from the entrance of septic germs through the torn tissues is avoided when no break in their continuity is caused. As there is usually metritis, it is well to use a blunt curette after divulsion. This is indicated to remove from the endometrium any detritus of the retained menstrual blood. The interior of the uterus is then treated to an application of the carbolic

acid and glycerine, and the vagina cleansed. The carbolic acid must not be used copiously enough to run, and must all be removed from the vagina or painful burns may be inflicted.

Dilatation by means of tents is rarely done for stenosis except to afford access to the interior of the uterus for examination and treatment. Forms of stenosis where the canal is large enough to admit a tent are not cases that need treatment for the constriction of the cervix. The use of tents was formerly advised in cases with patulous canal but with hard, unyielding walls that resisted the entrance of large instruments or an examining finger. Barnes' dilators

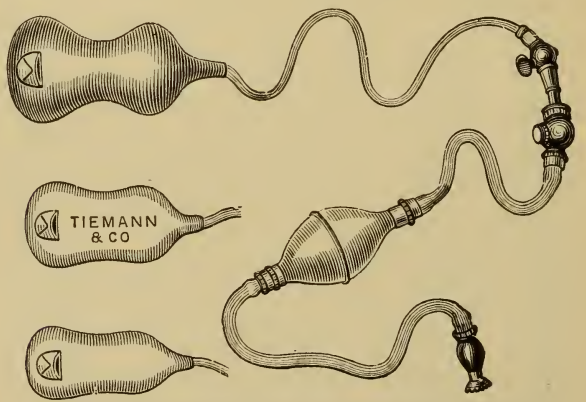

Fig. 45. Barnes' Dilators, with Apparatus for Inflating.

are frequently advised in these cases. They consist of rubber bags (Fig. 45), which are placed in the cervical canal and then forcibly enlarged by pumping water into them. The pump is also seen in the figure. There is no real narrowing of the canal in these cases, consequently they will not receive

further mention here. The use of tents is fully described elsewhere.

After the canal is thoroughly dilated some mechanical appliance may be required to prevent contraction. A number of "stems" have been invented for this purpose.

Drains and Stems.—Thomas' glass stem with a cup pessary to hold it in place has been described elsewhere, as well as the manner of its introduction. Outerbridge's drain was also described. Either may be introduced immediately after the divulsion is completed, and while worn must be carefully watched and frequently examined to see that everything is progressing as it should. The drain needs less care than a stem, and has been introduced many times in patients who started for distant parts of the country to be gone a number of months, and who have returned without event.

When used to relieve dysmenorrhœa in cases of comparatively slight stenosis divulsion is not required. The dysmenorrhœa in these cases is often caused by the endometrium, congested by the onset of the menstrual period, partially closing the internal os. The cervicla endometrium may also close the canal by congestion in the same manner.

Dr. Outerbridge invented a very convenient appliance for the introduction of the drains in cases which do not require divulsion (see Fig. 46). It can be used if desired, but an ordinary pair of dressing forceps will answer every purpose. The instrument is grasped between the blades so that their points extend a little beyond its upper end, and grasped in such a manner that the upper outward bends in the wires are compressed by closing the forceps upon it (see Fig. 47). The cervix is then caught with a tenaculum and

drawn forward, while the points of the forceps blades are gradually pressed upward into the uterus. When the angles at the lower part of the drain reach the external os, they are steadied there by a sound or cotton stick and the forceps are unlocked and withdrawn, leaving the drain in position. If there is flexion Bozeman's forceps can be used, the curve in the blades being suitable for either anteflexion or retroflexion. If the drain is too short it will not catch above the internal os, and is apt to be expelled with the next menstrual flow, if not before. Several sizes should be on hand and one chosen to suit the case. Figure 48 represents the drain in position in case of anteflexion of the neck.

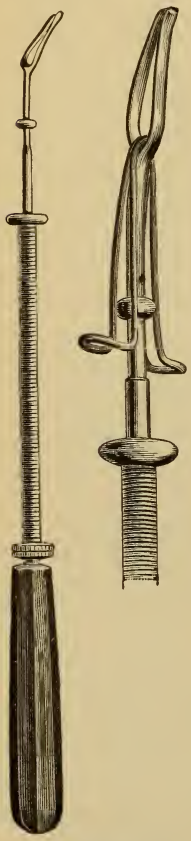

Fig. 46. Outerbridge's Instrument to Introduce his Drain.

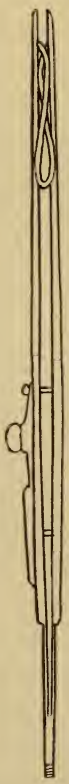

Fig. 47. Method of Grasping Drain in Dressing Forceps for Introduction.

In cases of metritis applications can be made to the endometrium without removing the drain. It also insures perfect drainage and is useful when offensive discharges from the uterus or tubes are present. A free en-

trance is also afforded to the spermatozoa. Should pregnancy occur the instrument must be removed as soon as possible. Although it has been worn fifth until the month and removed without interrupting the gestation, it is better not to risk the possibility of causing an abortion by wearing it too long. Pregnancy has occurred while wearing a glass stem and pessary. While this is not likely to occur, its possibility is important.

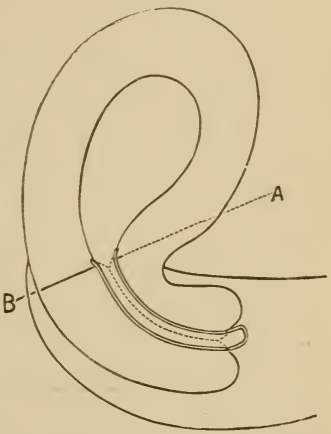

Fig. 48. Outerbridge's Drain in Position, Case of Anteflexion of the Neck.

Where the stenosis is *unyielding* and cannot be divulsed with any justifiable amount of force an operation can be done to restore the canal to a patulous condition. This is not so frequently needed for stenosis as for atresia. The operation is much similar to the discission done by Sims for the relief of extreme, irreducible flexion. The incisions may have to be carried high up into the uterine body, and the canal must be kept patent by some kind of stem to prevent cicatricial contraction or healing together of the denuded surfaces.

In cases with *long pointed cervix* and very small external os amputation by removal of a cone-shaped piece from the end of the cervix should be done. This makes the external os large and leaves the cervix shorter. A stem or Outerbridge's drain may be worn while the sutured parts are healing, to prevent complete closing of the canal.

Atresia at the cervix occurs rarely as a congenital condition; when present, the imperious point may be at either os. Acquired atresia is also rare. It is usually the result of healing raw surfaces which may be caused by caustic applications, ulceration, or mechanical injury. Extensive burns from caustics causing sloughs have adhered when healed and healing syphilitic ulcers have united, causing atresia. The usual mechanical causes of atresia of the cervix are lacerations or sloughs from delivery and the uniting of surfaces denuded in operative procedures.

The chief *symptom* is suppression of the menstrual flow, with presence of the menstrual molimena. If the atresia be congenital the patient will never have any menstrual flow. If the patient has passed the menopause when the atresia occurs she may have no symptoms whatever from it.

The Treatment of atresia of the cervix has already been described in speaking of atresia of the upper vagina. When it is necessary to drain the uterus, puncture or incision is needed, but when the menopause has set in, operation is unnecessary.

Atrophy of the cervix, if congenital, is generally due to a failure of development, and is usually accompanied by similar want of development of all the genital organs. Acquired atrophy is occasionally found after parturition as a result of hyper-involution in which the uterine body shares.

The Symptoms are amenorrhœa and diminished size of the cervix and uterus. There is dysmenorrhœa in many cases. The sound reveals a small uterus, as does bimanual and rectal examination.

The congenital variety of atrophy is treated first by general remedies to increase the nourishment of the general system, and favorable surroundings for improved health. Tonics, exercise in the open air, and nourishing and easily assimilated food produce better results than local treatment. The latter consists mainly of electricity in tonic form and the removal of causes for dysmenorrhœa if present.

The post-puerperal atrophy is only temporary. The return of the functional activity of the uterus should be promoted by tonics, etc., as above mentioned. Hot injections and repeated passing of a large sound will aid in restoring the uterus to its normal condition. Pregnancy may occur and usually cures the atrophy.

Hypertrophy of the cervix has already had consideration in the chapter on metritis and prolapse. It is most frequently a consequence of laceration or abnormal growths, although occasionally it exists as a congenital condition. The cases not due to metritis, with or without laceration or neoplasms in the cervix or body of the uterus, are very rare, and are generally due to congenital deformity. The cervix may be enlarged in its vaginal portion or in the super-vaginal portion. The enlargement may be due to growth of the mucous membrane and the production of new glands with resulting softening from degeneration. This variety is distinguished by the softness to the touch that is present. The other form of hypertrophy is due to the over-production of connective tissue, and is distinguished by its hardness.

The Symptoms are dysmenorrhœa if the enlargement brings the cervix low in the vagina, dyspareunia when it is large

enough to interfere with coition, pain in the pelvis, metrorrhagia, and leucorrhœa.

The Treatment is amputation of the intra-vaginal portion, usually by conical incision. The supra-vaginal portion will usually undergo a process similar to involution after the operation has been done, thus effecting a cure.

CHAPTER X.

METRITIS.

Inflammations of the uterus are among the most common conditions of disease found in the pelvis. Subdivisions have been made into various kinds of uterine inflammations, but they are usually refinements of pathological differentiation and consequently of little value to the practitioner, as they can rarely be defined clinically. A simpler classification is better for practical work.

The term *metritis* has been applied to inflammation of the uterine tissue, the term endometritis being used where the mucous membrane only was involved. It seems better to call all inflammations of the uterus metritis, and the term will be so used here. Corporeal inflammation without involvement of the mucous membrane is rarely if ever found, the involvement of the muscular tissues being a sequence of that of the endometrium. The mucous membrane lining the interior of the cervix may be involved alone, but is almost always involved when that of the uterine body is, consequently both are parts of one condition, and their description together avoids much repetition. Metritis is most frequently a sequence of either gonorrhœa or the puerperal state.

Gonorrhœal Metritis.—That from gonorrhœa may begin as an acute vaginitis, in which the uterus may or may not par-

ticipate, or it may come on without any history of acute symptoms. This latter form is usually acquired from an attenuated infection, as from a gleet, or from an old suppressed and supposed to be cured gonorrhœa in the male. In either case the vulva and vagina are usually first involved, then the cervix, and finally the whole interior of the uterus, whence its course to the Fallopian tubes is rapid.

Puerperal Metritis.—The infection producing metritis from puerperal causes may also come from without, but its manner of entry is different. The germs are probably from the vagina and cervix, and the subinvoluted uterus, with or without placental remains, forms a suitable nidus for their reception. The vagina and cervix up to the internal os probably contain more or less pathological germs at all times. An abnormally patulous cervix may admit these to the uterine cavity to set up inflammation there. The presence of placental or other tissues remaining from a pregnancy prevents the uterus from resuming its normal size after delivery. This is much more apt to occur after abortion than delivery at full term. This subinvolution may also result from getting up too soon after the expulsion of the fetus, or from instrumental interference for its removal. The uterus may assume an abnormal position causing congestion and preventing involution. The entrance of germs is necessary in conjunction with one of the above-mentioned conditions to produce metritis. These may be carried in by unclean hands or instruments, or may enter as a result of carelessness in cleansing the external genitalia, or failure to keep the vagina in an aseptic condition during the puerperal period.

Other Varieties.—Metritis may be caused by the passage

of a sound, or the entrance of germs from the vagina in a non-puerperal state, or germs may be forced into the uterine cavity by an improperly used vaginal douche. The latter accident is most frequently caused by using a douche tip with a single opening directly in the end, allowing the stream of water to strike the external os with force and volume enough to enter the uterus. The germs may also enter by closure of the external os while the plug of the contaminated mucus remains in the cervix, and is forced into the uterus, setting up septic inflammation. This accident usually occurs about the time of the menstrual flow.

Metritis in Single Women.—There is a form of metritis found in single women due to a variety of causes. The most common among these are excessive dancing or other violent exercise during menstruation, the use of machinery worked by foot power, as the continuous running of a sewing-machine, running up and down stairs, standing on the feet for long periods, or anything that tends to keep the uterus congested, and thus in a favorable condition for the entrance of septic elements.

All these forms of metritis, except occasionally the gonorrhœal, are chronic when they come under observation. It has not been determined whether they had an unappreciated acute form preceding the chronic condition or not, but most authorities maintain that metritis is often chronic from the start.

Results of Metritis.—Metritis rarely results in spontaneous cure. The tendency is to continue. Davenport claims that the congestion present causes a growth of connective tissue which by contracting eventually lessens the caliber of the

blood-vessels and produces atrophy of the muscular tissue. This converts the uterus into a fibrous body, and if uninterrupted would cause the "atrophic metritis" of Skene.

A more common result of metritis is extension of the inflammation to the tubes, causing salpingitis, frequently to be followed by peri-salpingitis and ovaritis. The gonorrhœal and puerperal forms are more likely to extend to the appendages than the other varieties, and the results there are more serious. In these forms the pelvic inflammation more frequently causes abscess with a general peritonitis as a frequent result, and fatal terminations are not infrequent.

Metritis limited to the cervix always results from a vaginitis. Cervical metritis of puerperal origin is always accompanied by inflammation of the body as well, though the latter may be present in a mild form. When there has been laceration or much bruising of the cervix during labor, causing sloughing or erosion, the whole uterine mucous membrane is more or less the seat of inflammation. The inflammation of the cervix in these cases is largely in excess of that higher up in the uterus, but it must be borne in mind that the uterus anatomically includes the cervix, and there is seldom, if ever, inflammation of one part to the entire exclusion of the other.

Metritis Chiefly in the Cervix.—It is well, however, to devote some space to the special description of conditions in which the inflammation is chiefly localized in the cervix. Where the metritis has persisted in the cervix for a length of time it may invade all the structures, involving, step by step, the muscular and fibrous portions, and causing hypertrophy.

The form of metritis in which the cervix is most involved may be attended by laceration, erosion, eversion, hypertrophy, congestion, granulations, cysts, etc., either as cause or result of the inflammation.

Erosions are frequently seen in cervical metritis. They are usually found at the side of the external os, covering a larger or smaller space on the crown of the cervix; sometimes the os is entirely surrounded by the eroded area. The appearance presented is that of a patch, usually round or oval, darker in color than the mucous membrane surrounding it. It may be slightly depressed, showing an abrupt line of demarkation, but more frequently there is a gradual shading from the diseased to the healthy tissue. These eroded patches are often covered with adherent mucus, but they may present a glazed appearance when the secretions from the surrounding vagina or the interior of the cervix are removed.

A congenital tendency to erosions is claimed by some authors, who also claim a corresponding immunity to exist in other cases. That it is a condition frequently found in young unmarried women favors the claims of hereditary tendency.

Erosion of the cervix is always associated with cervical metritis, and usually vaginitis is present. The uterine cervix is often eroded by irritant discharges from the uterine cavity; it may also result from mechanical injury received during copulation or from a roughly used syringe tip. The initial cause of the erosion may vary, but the condition is kept up indefinitely by irritant uterine secretions from the metritis within, or the secretions of the vagina itself, if they are at fault.

This condition is very frequently spoken of as "ulceration of the womb." It is certainly a misnomer to call these eroded patches ulcers, because there is no true ulcerative process. True ulcers may form on the cervix, but they are rare, and when they occur are usually specific, cancers or cancroids, or due to a follicular inflammation in which there is granulation associated with numerous small ulcers. When this raw surface is found on the cervix of a nulliparous uterus it indicates either metritis of congestive origin, or, which is more common, a metritis of gonorrhœal origin with existing or impending gonorrœhal salpingitis. The nature of the discharge will usually tell which it is. If the discharge coming from the external os is yellowish, thick, and tenacious, forming a plug in the cervical canal, it is almost always gonorrhœal. When the metritis is of congestive origin there is more local tenderness, the uterus and cervix being painful. Gonorrhœal metritis may exist without pain. Erosion on the cervix of a parous uterus may come from either of the above causes, or it may be due to inflammation of the endometrium due to retained placental fragments within the uterus. This form may also have an accompanying tubal involvement due to the same cause.

Cysts may be present in the cervix, complicating metritis. They consist of small, round, translucent masses that are usually hard, devoid of fluctuation, and slightly bulging above the surrounding tissues, though they may be so deeply imbedded in the cervix as not to present the last-named symptom. When punctured they are found to contain a clear fluid slightly thicker than water in consistency. The whole cervix may be studded with them, or there may be but two

or three. Their tendency is to increase in number, and they refill when punctured.

Eversion.—The mucous membrane of the cervix may become everted. This usually occurs more on one side of the external os than on the other, and frequently is all on one side. It may or may not be associated with laceration. Where no laceration exists there presents a roundish mass at one side of the os and partially encroaching upon its lumen. This mass is slightly raised above the surrounding parts and is covered with granulations. It is usually darker in color than the surrounding cervix. When touched with an applicator or probe it frequently bleeds freely. In these cases it is usually a formation of new tissues and not a true turning out of the cervical mucous membrane.

When eversion is found with laceration it is usually a sequence of that condition. The gaping of the torn parts allows the endocervical mucous membrane to become prolapsed. This is further provoked by hypertrophy resulting from the inflammation which follows the laceration. The laceration may be concealed by the fact that it does not extend to the external os, the tear being produced from within outward.

Hypertrophy of the cervix is always present with laceration, and will be spoken of again under lacerations. There is an hypertrophy found with cervical metritis where no laceration exists. This condition has already been spoken of. The inflammatory process extends from the endocervical mucous membrane to the deeper tissues, causing congestion, which is usually followed by increased production of connective tissue, causing a true hypertrophy. Hypertrophy occurs at times with elongation of the cervix, complicating that condition,

and may have been an etiological factor in its production. Figure 49 is taken from a case in which there was hypertrophy of the cervix.

Fig. 49. Hypertrophy of the Cervix.

Laceration of the cervix is either the result of parturition or mechanical interference. The latter cause is not common, but the cervix has been torn in efforts at a rapid divulsion. The usual cause of a laceration is delivery of a fetus, either by instruments or without them. Cases of laceration caused by the expulsion of a two-months fetus are on record. While this early abortion is a fruitful source of metritis, laceration is not so common from it as from the exit of a larger fetus.

A by no means uncommon condition is laceration at the inner os extending a variable distance down the cervix but not involving the external os. In these cases the external os dilates sufficiently to permit the passage of the presenting part, while the tissues around the internal os are unyielding and are torn. These cases of "concealed" laceration are at times very puzzling. They are more apt to occur where there has been a stenosis and hardening around the inner os with a flexion.

Lacerations vary from a slight depression in one side of the cervix to complete rupture extending through the whole length of the canal or even above the internal os. They may be single, bilateral, or stellate, and may extend so as to involve the vaginal roof. The result is a metritis with hypertrophy; erosion or eversion may follow, or both hypertrophy and erosion may result. The effort at spontaneous cure forms a cicatricial plug, which is usually hard and unyielding. This plug of inelastic scar tissue causes many of the symptoms, and the treatment which removes it is most successful in relieving the symptoms. Its presence is a fruitful cause of deeper laceration in subsequent deliveries, because this cicatricial tissue forms an obstacle to dilatation. It is also a frequent cause of abortion.

Lacerations followed by erosion or "ulceration" can only occur where there has been contact of septic material either from the external air, vaginal secretions, or unclean manipulation. Where there is perfect asepsis the torn surface heals over with a membrane similar in all respects to the normal mucous membrane of the cervix; there may remain some deformity from the tear, but no metritis of cervix or body is

found where septic material has been kept from effecting an entrance. This fact shows the importance of aseptic deliveries, either at full term or before the fetus has completed its period of utero-gestation.

Pozzi describes a "*pseudo-metritis*" occurring with disease of the ovaries, tubes, or with pelvic peritonitis arising from scars in the broad ligaments following removal of the appendages. He defines it as an inflammation of the uterine mucous membrane which is "merely an epi-phenomenon of tardy development, and not appearing at the first onset, which becomes evident only after the appearance of disease in the adnexa or the pelvic peritoneum." This condition is that of a sequence usually, and needs no further special mention.

Metritis also occurs with fibroma, probably causing the hemorrhage, and with carcinoma at the cervix or in the body of the uterus. These complications need no special consideration here.

A "*membranous*" metritis is described by some authors in which a perfect cast of the endometrium is passed at the time of the menstrual flow; it is frequently called membranous dysmenorrhœa; it is a rare condition. A granular form has also been mentioned, but cannot be distinguished clinically.

The Symptoms of metritis vary with the stage of the disease, and may also be influenced by the cause of the inflammation.

The majority of cases give a history that will aid materially in making the diagnosis. If it is a sequence of gonorrhœa there will have been an attack of acute vaginitis with its

symptoms. Painful micturition some time in the past is usually significant, especially if it was accompanied by profuse and thick yellowish leucorrhœa with burning sensations in the vagina. This may have been a year or more back, and it is significant to note if it began a short time after marriage. These cases are gonorrhœal, with rare exceptions. This history is more frequent among dispensary patients than in private practice.

The puerperal cases will likewise give a history that is plain. Careful questioning will elicit an account of an abortion or delivery occurring at or immediately before the onset of the symptoms. In these cases there is a period of a few weeks or months of almost constant flooding. The amount varies from loss of some blood each day to a number of irregular flowings either at the time of the regular period or irregularly. In the case of daily flowing cancer may be the cause. But the flowing from cancer begins with a slight "show" as a rule, and gradually increases in amount. That from puerperal metritis is of sudden onset or immediately follows labor. The flowing from fibroma also lacks the puerperal history, so that confusion is not common. It is well to bear in mind that the abortion may have been so early that its significance was not appreciated by the patient. She may have been nursing and had the flow, mistaking it for a return of the normal menses, or she may have been without her menses for only a few days over time, and will consequently say she never had an abortion when asked.

Metritis may be classified as hemorrhagic and catarrhal, the former being usually of puerperal origin and the latter of non-puerperal origin. The larger part of the catarrhal

cases may be traced to gonorrhœal infection for their inception, the remainder being due to hygienic errors and causes producing continuous pelvic congestion. The forms are distinguished by the nature of the discharges.

These cases of metritis are all chronic; an acute form may be rarely met with, but it requires only the usual treatment that acute inflammation occurring elsewhere should receive. There should be rest in bed and antiphlogistic treatment until the acute symptoms subside. Douches of very hot water will aid in allaying the congestion, and should be used until the acute symptoms subside enough to allow a careful examination to be made and the application of such local treatment as may be indicated.

The Uterine Syndroma.—The rational symptoms of metritis are taken by Pozzi as the type of "uterine syndroma." They are "pain, leucorrhœa, dysmenorrhœa, metrorrhagia, symptoms from neighboring organs (bladder, rectum), and symptoms from distant organs (digestive canal, nerves, etc.)." This term "uterine syndroma" may be used to signify the above symptoms occasionally to avoid repetition. They may all be present in metritis, but a general description of them will follow and not be repeated.

Pain may be complained of either in the hypogastrium, in either iliac region (the left more frequently than the right), in the lumbar region of the back, or low down in the pelvis. Some women claim to be able to locate a pain in the uterus itself. The intensity of the pain varies from a dull heavy ache which is constant, to sharp, lancinating pains which are usually intermittent but piercing.

The *leucorrhœa* of metritis also varies with its cause. That

from gonorrhœa is more frequently yellowish or greenish in tinge, and is generally thicker in consistency. That from puerperal metritis is more apt to be tinged with blood. If the inflammation is only in the cervix the leucorrhœa may be clear and viscid. It may also be thin and passed in gushes, there being none in the intervals.

In inquiring about the presence of leucorrhœa it must be borne in mind that women differ widely in what they consider an amount worth mentioning. Many women think a certain amount of discharge is normal and will deny the presence of any "whites," as they call it. Others again are so fastidious that the least amount of moisture is cause for complaint and leads them to seek the advice of a physician. It is well in all cases for the physician to ascertain for himself the amount and character of the flow when the other symptoms indicate its possible presence. Careful questioning as to the amount is always needed, answers as to its presence or absence being unreliable.

Dysmenorrhœa is not a constant symptom in metritis, and when present is usually due to some mechanical obstruction to the flow.

Menorrhagia and Metrorrhagia.—Excessive amount of the flow is due to congestion of the uterus or to impaired condition of the endometrium. When it occurs at the normal period it is called menorrhagia; when the loss of blood is at other times it is called metrorrhagia. The cause of the hemorrhage may be puerperal metritis, fibroma, or carcinoma, and it is sometimes found in cases of anæmia. In anæmic cases from wasting diseases or chlorosis, amenorrhœa is more frequent. This may also occur in a later stage of me-

tritis, when the patient has been depleted by suffering or loss of blood, or where the growth of fibrous tissue in the parenchyma of the uterus has compressed the blood-vessels, causing a local anæmia.

Sterility is a symptom of metritis, the inflamed endometrium being unfavorable to retention of the ovum, even if it becomes impregnated before expulsion from the uterine cavity. When pregnancy does occur it usually terminates in abortion at or before the third month.

The *bladder* symptoms, painful and frequent micturition, are frequent but not constant. There is usually constipation, which is often accompanied by frequent, ineffectual desire to defecate. There may be vesical or rectal tenesmus. These rectal and bladder symptoms may be due to the general pelvic congestion in which these organs participate, or they may be due to interference caused by pressure of enlarged or displaced genital organs.

Alimentary Disturbances.—The effects of uterine disease on the functions of digestion are pronounced. The most common results are loss of appetite, nausea, and flatulence. The latter is often the symptom for the relief of which the patient seeks advice. Dilatation of the stomach has been found with uterine disease, probably more as a coincidence than as a consequence. There may be vomiting. These digestive symptoms are reflex, as are the so-called "uterine cough," headaches, and neuralgiæ. They are very annoying to the patient and may lead to errors of diagnosis. There is usually no lesion except the uterine condition, and the symptoms disappear with its cure.

Uterine Reflexes.—Some characteristics of these uterine

reflexes are worth mentioning here. The headaches are unique, both as to situation and character. The most common type is a dull pain in the top of the head, which is described as pressing on the brain. If the area is extended it is in the direction of the back of the neck, and it may extend down into the spinal column, but this is rare.

The uterine cough is usually dry and hacking, the sound being of such a nature as to alarm the friends. The effort of coughing usually occurs from two to five times in succession. There is no lung or throat involvement.

Impairment of voice is met with, resulting from disease in the pelvis. By some authorities this is attributed to ovarian disease, by others to disease located in the uterus. One authority claims to be able to tell when a singer is menstruating by the impaired tones of the voice.

Spasm of the larynx has occurred from applications made to the uterus. Many of my patients claim they can taste the creosote the moment the applicator passes the internal os when intra-uterine applications are made. This symptom has also been noted in the experience of a number of my colleagues.

Digital examination gives the evidence on which the diagnosis is established. The condition of the cervix is noted. If there is laceration depressions are felt in the rounded end, depending in number and depth upon the kind of tear. There may be only one shallow break in the contour of the ring surrounding the external os, or the depression may extend up to the point where the vaginal mucous membrane passes from the cervix to form the vault of the vagina. The edges of the laceration may be close together or widely sepa-

rated, or the parts may be so torn as to divide the cervix into two parts, the tear having been bilateral. Laceration may be found with any of the other conditions occurring with cervical metritis.

Erosion can usually be detected by the touch, the difference in the mucous membrane being appreciated by the examining finger. The view through the speculum corroborates its presence.

The consistency of the whole uterus is noted, as is its size. In metritis there is always enlargement, the increase in size being most in the part most involved. This is detected among the first things. The cervix is harder in hypertrophy, especially when fibrous formation has begun. If cysts are present they feel like small points that are raised and harder than the surrounding parts. Eversion is seen at once and suspected from the impression given the sense of touch. At times the external os is slightly enlarged, admitting the tip of the finger; its contour is unbroken but presents a hard, unyielding ring to the touch. This is a common condition when metritis exists with some hypertrophy of the cervix. There may be stenosis of the internal os with such a condition, and an enlarged uterus.

The view of the cervix as seen through the speculum is important. Lacerations are evidenced by gaping of the torn parts, erosion by their darker color; eversions are also darker, but are usually raised above the adjacent tissues. The size of the cervix is distinguished, and cysts, if present, are seen scattered about over its surface. The quantity and kind of the discharge from the cervix is important. There may be almost none, but at times a translucent ropy plug is

seen, which is so adherent that it is difficult to remove. The size and condition of this mucous plug in the cervix has an important bearing on the treatment.

The Treatment of metritis varies with the cause and the part most involved, and also with the stage of the disease. When treatment is begun early the chances of recovery are good but gradually diminish as the disease progresses. When sclerosis results from excessive production of connective tissue due to the excessive congestion, the uterus becomes very hard, the body being elongated while the cervix is short. This condition causes local anæmia and resulting amenorrhœa, and is said to be incurable by Noeggerath, who describes it, calling it "chronic metritis." It really is a late stage of chronic metritis, and is seldom seen in cases that can have early treatment, because it is avoided. Electricity may be tried in cases seen too late for cure by the usual methods.

The treatment of metritis involving the body of the uterus more than the cervix must take the condition of the appendages and pelvic peritoneum into consideration. If these organs are involved much care must be exercised, though some authorities advise active interference even when they are in a state of active inflammation. When there is active sepsis with fever, and symptoms of poisoning of the general system indicating that placental or other abnormal tissue is within the uterine cavity, its removal must be the first consideration. The removal of all the septic material is best done under ether. The dull wire curette is usually sufficient, though adherent tissues may call for the sharp curette for their removal. In curettement for the removal of such

foreign bodies the entire endometrium must be passed over. There may be very small particles adherent to it, and if all parts are not scraped some may be missed. The removal of all granulations is essential, as very small points of granular tissue may remain to keep up the infection. The points of the uterus around the entrance of the Fallopian tubes should be gone over several times. These openings may be closed, and a thorough curetting may remove the obstruction and allow the tubes to drain themselves. It is of course necessary to dilate the cervix, if small, and provide for drainage of the uterus through it after curettement.

Unless the urgency of continued infection is present the palliative treatment is best to use while the inflammation in and around the appendages is active. This is best done by applications made to the vaginal roof. The mucous membrane surrounding the cervix is painted with tincture of iodine, or tincture of iodine with beechwood creosote, equal parts of each, or if much congestion is present the pure Monsel's solution may be used. If there is erosion at the cervix the iodine and creosote will heal it over at the same time. After the active inflammation in the appendages has been allowed to subside, a curettement can be done, or the metritis treated in the usual way by intra-uterine applications. Lacerations with eroded edges are healed by the tincture of iodine and creosote. Hard cicatricial masses from laceration are absorbed by the applications of iron. Since these masses are a cause of many of the nerve symptoms that accompany uterine disease this absorbent action of the liquor ferri subsulphatis is productive of much benefit. Lacerations of considerable depth will heal under this treat-

ment when persisted in for sufficient time, and the reflex symptoms will all disappear. This ability to heal deep cervical lacerations without operation is a great boon to many women who dread operations; they will cheerfully submit to be treated for many months rather than take ether. Persistent applications of the Monsel's solution in full strength will eventually restore any but the very worst form of lacerated cervix to a condition that will produce no symptoms, and she will be in safer condition to go through a new parturition than if an operation had been done.

Most cases of metritis should have a tampon applied after the other medicines. If there is much congestion it should be thoroughly saturated with glycerine and should fit firmly enough to exert considerable pressure. The tampon also absorbs the drugs applied, and by remaining in contact with the mucous membrane gives a prolonged application. It should be worn for from twelve to twenty-four hours, but must always be removed when pain is produced. When no congestion exists the glycerine should be omitted.

If cervical metritis is also present some application should be made to the endocervical mucous membrane. The iodine and creosote acts very well at times. If the mucous discharge is very tenacious equal parts of pure carbolic acid and glycerine will remove it. It is necessary to remove this plug of mucus before the remedies can reach the underlying mucous membrane.

When there is much congestion of the cervix the blood should be removed by puncture with a lancet and allowed to bleed for a time. A leech may be applied to the cervix to deplete it if the puncture is not sufficient. The artificial

leech may be used for this purpose. The glycerine is indicated in these cases.

After the inflammation in and around the appendages has subsided treatment can be directed to the endometrium. A radical removal of all septic material from the uterine cavity is indicated, after which the whole parturient canal must be kept in a condition of the most thorough asepsis. For the removal of detritus the dull wire curette is the safest instrument (see Fig. 34). After the cavity is thoroughly cleansed with this, a strong antiseptic should be applied. The best is carbolic acid, either pure or a fifty-per-cent solution in glycerine. The application must reach all the mucous membrane within the uterus from fundus to cervix. Care should be taken not to let any of the acid remain in the canal, and also not to allow it to come in contact with the vaginal mucous membrane or to run out over the external parts.

The cervix must be kept open either as a result of thorough dilatation, or by gauze or an Outerbridge drain. The gauze is used when the dressings are to be changed frequently and new applications made. The interior of the uterus should be made as dry as possible first. The gauze is previously made aseptic by baking, and is in long strips about an inch in width. This is taken near the end with a clean pair of forceps and carried to the fundus. Two or three loops thus carried the length of the uterus will do for drainage, but if there is tendency to discharge from the uterine mucous membrane pressure must be made by filling the cavity with gauze. It is not wise to pack too tightly or leave the packing in very long if there is purulent discharges from

the tubes, for the pus may be dammed back and forced out their fimbriated ends into the abdominal cavity.

Where there is tubal discharge and no need of intra-uterine pressure a drain to keep the cervix open is best. The gold wire drain invented by Dr. Outerbridge answers this purpose well. Figure 50 shows the drain in position and the ease with which an exit for the contents of the tubes is afforded by it. The vagina and vulva must be kept clean by frequent douching and bathing with hot water and mild antiseptic solutions. Mild solutions of bichloride of mercury are best for bathing the vulva, plain hot water being usu-

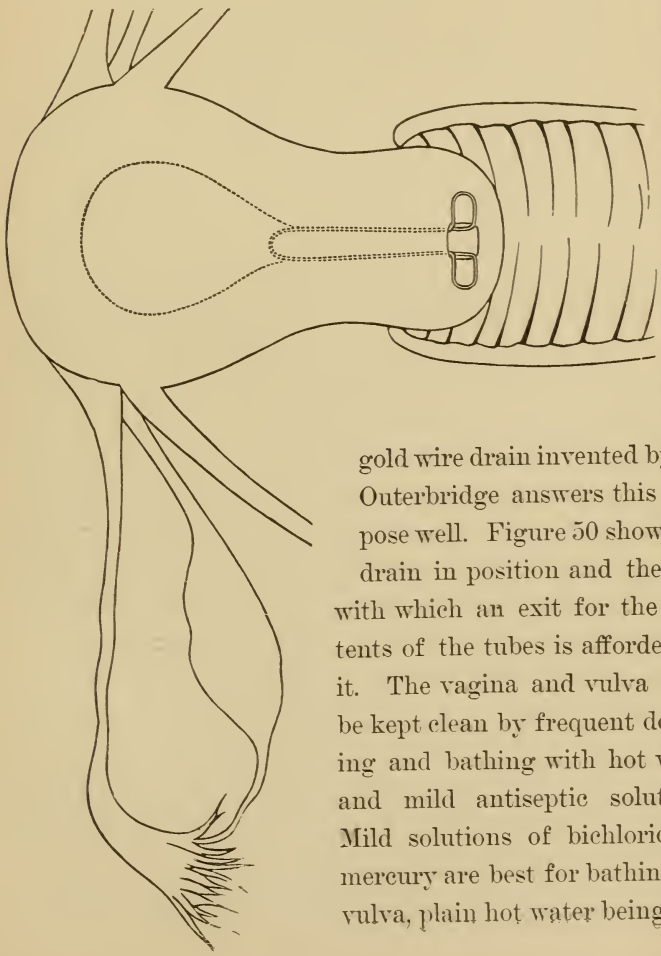

Fig. 50. Drainage of Fallopian Tubes through the Uterus, the Cervix being kept open by an Outerbridge Drain.

ally sufficient for the vagina, although borax, sodium chloride, or salol may be used, or the bichloride or carbolic acid solutions may be indicated if the discharges are very offensive. In using these stronger solutions the plain hot water is first used, and only the last pint or two of the douche contains the antiseptic.

Intra-uterine Applications.—Milder cases of metritis do not need the curette but must have intra-uterine applications. These are made in various ways. The uterine applicator is probably the most used for this purpose. This is a long, flat piece of flexible metal with a blunt point (see Fig. 51). In using, it should first be moistened and then tightly wrapped with a thin layer of cotton from the point far enough back to allow at least an inch of the wrapped surface to remain outside of the external os when the point is at the fundus. For manner of wrapping see Figure 52. The point should be well protected with the cotton. Figure 53 represents the applicator wrapped for using. This cotton is saturated with the medicament after the applicator has been bent to the curve of the uterine canal; the instrument is then introduced through the cervix and carried gently to the fundus. It is well to let the applicator remain in the uterus for a few seconds before removal. If any obstacle is felt to its introduction a tenaculum can be hooked into the cervix and by gentle traction the canal straightened somewhat to permit an easier passage; this will also prevent the cervix from dimpling with the point of the instrument so as to prevent its free entrance. Very little force can safely be used either on the tenaculum or the applicator.

The remedies used for intra-uterine applications made in

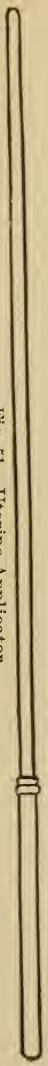

Fig. 51. Uterine Applicator.

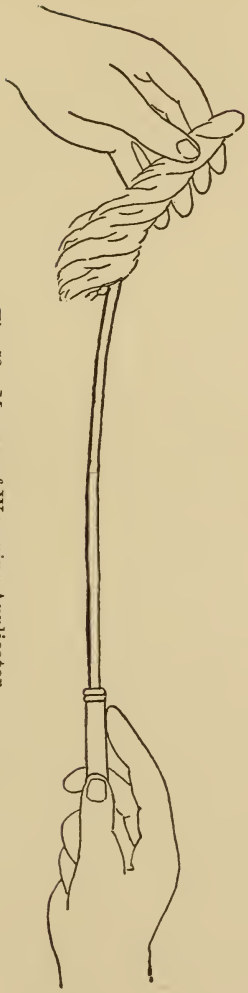

Fig. 52. Manner of Wrapping Applicator.

Fig. 53. Applicator Wrapped for Use.

Uterine Applicators.

this manner are pure tincture of iodine, tincture of iodine and creosote, or carbolic acid and glycerine, equal parts of each, and Monsel's solution.

Applications to the endometrium may be made every three days if they do not set up too much reaction. In some cases they can be made only once in ten days or every two weeks, the treatment at the intervening visits being limited to applications to the vagina.

Injections of various remedies directly into the uterine cavity are recommended by some gynecologists. A more copious application can undoubtedly be secured in this way, but it is not devoid of risk. Pletzer records a case of death following intra-uterine injection of the official (German) solution of ferric chloride for hemorrhage, in which the autopsy showed the cause of death to be heart thrombus. A vein continuously filled with clotted blood was traced from the uterine mucous membrane to the internal iliac vein.

Substances used as intra-uterine caustics are pure tincture of iodine or Churchill's tincture, strong solutions of zinc sulphate, nitrate of silver, peroxide of hydrogen, etc.

Arnaud applies a pencil of pure copper sulphate, which is left within the uterus. Only one application is made, and cures are claimed in from four to twenty-five days. I have seen no record of this treatment being tried in America. Antiseptic douches to the vagina are used for two days, and full doses of bromide given for one day before applying the pencils.

Rheinstader of Cologne first used zinc chloride for intra-uterine applications. This he dissolves in an equal quantity of water, and injects the solution into the uterus not more

frequently than every five days. There will be a copious purulent discharge for two days after each application. The application is followed by the introduction of a glycerine-saturated tampon, to be worn twelve hours.

Euphorin in the form of a powder has been blown into the uterine cavity or injected in the form of a solution containing one part of euphorin to three of alcohol. This is the method recommended by Bergeric.

Electricity has many advocates who extol its virtues as a caustic in metritis. Its great objection is the difficulty in cauterizing the entire surface of the endometrium with it. The granulations can be removed much more certainly with the curette or reached more thoroughly with liquid caustics introduced with an applicator. The merits of electricity will receive more attention in the pages devoted to the treatment of fibroma.

Treatment of Cervical Metritis.—Some points in treatment of metritis located chiefly in the cervix have already been touched upon. The applications of iodine and creosote, of Monsel's solution of iron, and of glycerine-saturated tampons have already been mentioned and their uses indicated. It is only necessary to say of them that much patience is called for on the part of patient and physician in order to secure their best results. It may be necessary to keep up the treatment for many weeks, and it is always advisable to make several applications at intervals of two or three weeks after the metritis is seemingly cured. This will enable the physician to guard his patient against relapses, and she will also be less liable to commit hygienic errors when she knows she must make a few more calls on her physician.

Conditions of the cervix requiring special mention as to treatment are hypertrophy, cystic formation, and extensive laceration. If the hypertrophy is extensive and fails to yield to the applications above mentioned, it may be necessary to amputate. This is usually done by removing a cone-shaped piece, with the external os in the center of its base and its apex as near to the internal os as may be indicated. The resulting opening is then closed by sutures making one line, the canal being kept open by a metal drain or glass stem.

If cysts are present there is usually hypertrophy as well. They must all be carefully dissected out, as a part of one will cause recurrence if left. The only cure for these is their removal.

Hard nodular masses are sometimes found in the cervix with metritis. They can at times be absorbed by local application of Monsel's solution, but they, if they prove refractory to this treatment, must be removed by the knife. The actual cautery has been used for removal of cysts and nodules, but the knife is more easily controlled and therefore more satisfactory.

Lacerations of considerable depth and extent can be made to close completely by local remedies applied directly to them. The nitrate of silver in the form of lunar caustic has long been used for this purpose, but since its use began the pure liquor ferri subsulphatis has found even better favor, and its results are at times surprising. When the tear is extensive and the resulting metritis is intractable, or where the curette is indicated for the endometrium, it is best to repair the cervix by operation during the etherization. The most important points about this operation are perfect asepsis, removal

of all hypertrophic tissues, perfect apposition of the denuded surfaces with as few stitches as possible, provision to keep the cervical canal from closing, and uninterrupted drainage of the uterus during the healing period.

The importance of hot douches must not be overlooked in all cases of metritis. They should be persisted in no matter what the plan of treatment employed. They should be hot (from 110° to 118° by Fahrenheit's thermometer), copious (from one to two gallons), and should always be taken with the patient in the dorsal recumbent position. The importance of this position for the vaginal douche cannot be too forcibly impressed. Patients will invariably take it squatting over a vessel unless taught otherwise. It is safest to inquire in all cases and to impress upon her the necessity of lying on her back to take her douche. The frequency of the douche varies from every few hours to twice daily. If there is tendency to hemorrhage or acute inflammation it should be used every two or three hours, while in cases of simple metritis twice each day is sufficient. Its only contra-indication is ovarian inflammation, which requires that the temperature be lowered.

In metritis, as in ante-displacements of the uterus, an abdominal band will often give the patient much comfort; this is especially true of stout women. The band should be broad, and so worn as to raise the lower abdomen. It must not be worn as a belt, which, like the corset, forces the contents of the cavity downward and causes bulging and laxness of the walls immediately above the pubes. This is precisely the place where support and pressure are needed; perineal bands may be required to keep the binder down in place.

Patients with metritis must not dance or take long walks, and they should not use their feet as motive power for machinery, neither should they stand for long periods nor sit for a long time in one position. They should have light exercise in the open air and treatment for the general health. It will be wise to have them lie down more or less each day, and in severe cases the recumbent position must be maintained until improvement sets in.

The Medicinal Treatment of metritis varies with the general health of the patient. Stout, plethoric women require remedies to stimulate the liver and relieve constipation. This is frequently attained by the following prescription:

℞

Sodii. bicarbon..... ʒ ij
Pulv. rhei..... gr. xlv
Pulv. ipecac..... gr. vj
Aquæ menth. pip.....q. s. ad ℥ vj

M. Sig. ʒ ij before meals in a wine-glass of water.

If much flatulence is present with large tympanitic abdomen, ten or fifteen minims of tincture of nux vomica should be added for each dose in the above prescription.

The fluid extract of cascara segrada can be used for the constipation if an additional purgative is needed. It is best given in doses of from twenty drops to a teaspoonful in water before retiring. Women of this type will need the above prescription for many months. They are frequently above forty years of age and have neglected the condition of their alimentary canal for years, and much time is required to get these organs to perform their functions without assistance; they have the constipation habit, and must supplant

it with the habit of regular daily evacuations. A most important factor in the treatment is to get them to realize the importance of a daily defecation.

Women with metritis of gonorrhœal origin, and frequently with tubal involvement from the same cause, will require different remedies for their general health. If there is constipation with sluggish liver and large, flabby abdomen, the rhubarb mixture and cascara will be indicated. But these patients are usually more or less anæmic. They are frequently much helped by taking the "four chlorides," the best formula for which is probably the following:

℞
Hydrarg. chlorid. corros..... gr. j
Liquor. arsenic. chlor.
Tr. ferri. chlor.
Ac. hydrochlor. dil..... āā ʒ iv
Syr. simplex..... ℥ iij
Aqua.....q. s. ad ℥ vj
M. Sig. ʒ ij after meals.

This must be well diluted in water. It can be taken for six weeks, when its use must be suspended for a month, and then it can be resumed for the same period as before. This plan may be continued for about six months if benefit result from its use.

Metritis occurring in unmarried women or in women who have not borne children is often accompanied by anæmia, either as a result of overwork and faulty assimilation of food, or due to the depletion from loss of blood from the uterus. The alimentation must first be corrected in all cases, and after the tendency to hemorrhage has been controlled large

doses of iron must be given in the manner indicated in the pages devoted to anæmia. Where the uterus is large and tender, with tendency to menorrhagia or metrorrhagia, it is well to stimulate its muscular fibers to contract by internal remedies. The fluid extract of the cornuta secale with tincture of nux vomica acts well for this purpose. Twenty minims of the ergot with ten minims of the nux vomica should be taken in water before each meal. The fluid extract of hydrastis canadensis may be added with profit when the hemorrhage does not yield to the above treatment, or it may be substituted for the ergot in case that drug should disagree with the stomach.

℞
Extr. ergot. fl.
Extr. hydrast. fl. ..... āā ʒ j
Tinc. nucis vomic. ..... ʒ ss
Tinc. gentian. comp. ..... q. s. ad ʒ vj
M. Sig. ʒ j before each meal, in water.

The use of these remedies for metritis without local treatment is not in accordance with modern methods of treatment. Some effort must be made to remove the cause, the internal remedies being simply adjuvents to the local treatment which has been already outlined. The treatment of retained placenta with or without metritis has received attention under the head of uterine hemorrhage.

CHAPTER XI.

UTERINE DISPLACEMENTS.

The normally situated uterus rests in the pelvis in a position corresponding to the curvilinear axis of the pelvic canal. It has a slight curve forward, "the normal anteflexion" of the uterus. This anterior curve is obliterated by the pressure of a full bladder, and is exaggerated when the bladder is empty. The condition of the rectum also influences this curve, but in a minor degree, pressing the fundus more anterior when full, and allowing it more room in the hollow of the sacrum when empty. These movements indicate a certain amount of variation in the curve that is not pathological. The relative position of the uterus and other pelvic organs is shown in Figure 54.

The Supports of the Uterus.—The uterus stands upward from the pelvic floor, and is held in position by ligaments. The strongest of these are the utero-sacral ligaments, which are attached to the sacrum at their posterior ends. They are strong and inelastic. Their uterine attachment is at either side, on a level with or slightly below the internal os. This causes the thinnest part of the uterus to be the fixed point when these ligaments are tense; the uterus thus rests as a cone on its apex, making displacements easy.

The other supports are the broad ligaments attached to the sides of the uterine body and reaching to the sides of the

bony pelvis, the round ligaments, also at the sides, and the fold of perineum connecting the bladder with the uterus.

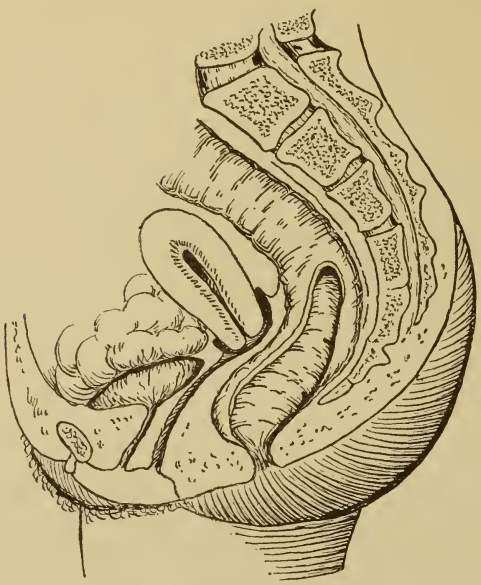

Fig. 54. Correct Position of the Pelvic Organs. (C. H. B.)

All the ligamentous supports of the uterus are so attached as to allow a considerable amount of motion in all directions. It is only when its position becomes permanently changed that the condition can be called pathological. These malpositions are usually the result of some diseased condition of the uterus or its surroundings.

Deviations from the normal are classed as "displacements in the vertical planes" and "displacements in the horizontal planes." The former term includes "versions" and "flexions," and the latter "elevations, prolapses, and inversion"

(Pozzi). There is also a condition in which the uterus as a whole is moved backward or forward—usually backward into the hollow of the sacrum. These are called ante- and retro-positions, and are not of much importance of themselves, being complications of other diseases.

Anteversion.—The attachment of the utero-sacral ligaments at the narrowest point of the uterus gives it a position as if swung upon pivots, and the fundus can swing back and forth and to the sides to a limited extent under normal conditions. The cervix in the vagina always swings in the opposite direction, its movements being less in extent because its distance from the fixed point is less.

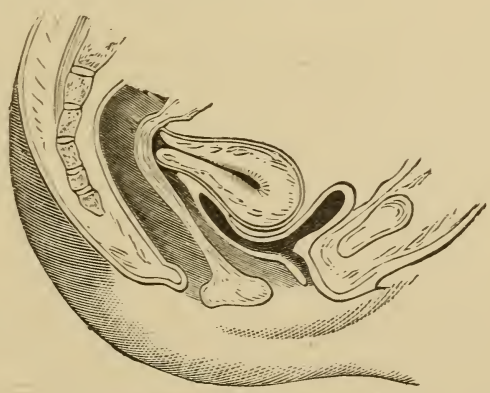

Fig. 55. Anteversion.

When anteversion occurs from any cause the fundus passes forward and downward farther than usual, and remains in this position. The normal anterior curvature is obliterated, and the uterus lies straight and flat, in contact with the anterior vaginal wall and the bladder, the fundus being behind the pubes. The cervix at the same time passes upward and

backward, occupying a position high up in the posterior cul-de-sac of the vagina, its opening pointing backward (Fig. 55).

The Causes of anteversion are usually found in the uterus or its appendages. Subinvolution is a common cause; the uterus fails to resume its normal size and tone after parturition, and falls out of place because of its weight. Metritis from non-puerperal cause, relaxation of the ligamentous supports of the uterus, prolapse of the appendages, and perisalpingitis are frequent etiological factors in causing anteversion.

The Symptoms are variable, anteversion being found at times without any symptoms being complained of. There is usually found, however, the usual symptoms of pelvic disease, as pains in the pelvis, tenesmus, etc. There may be leucorrhœa, dysmenorrhœa, menorrhagia, or metrorrhagia, but these can usually be accounted for as due to associated metritis, salpingitis, etc. The most frequent symptoms are bladder irritability and frequent micturition. There will at times be nervous symptoms associated with anteversion, but these are more frequently found with anteflexion.

Examination.—The examining finger with difficulty finds the cervix far back in the posterior pocket of the vagina, and can follow the outline of the uterus anteriorly along the anterior wall of the vagina to the fundus. Rectal examination will show the absence of the fundus in its normal position, and if any doubt remains it may be removed by a bimanual examination; but this is seldom needed. The passage of a sound is often difficult and at times impossible in these cases, and is not devoid of danger. When attempted, it will usually be found easier to accomplish if the

cervix be drawn downward and forward with a tenaculum. If adhesions have fastened the fundus to the anterior peritoneal depression, it will usually be impossible to get the sound passed, and too much effort to do so may set up a pelvic peritonitis with all its dangers and embarrassments. It is best not to attempt to pass a sound in these cases.

The Treatment must take into account the associated conditions that are found. If there is metritis it must be treated; if prolapse of the adnexa, effort must be directed to them; if inflammation around the tubes, it must be absorbed before any special efforts are directed to the mal-position itself. Where adhesions exist remedies should be applied to the vaginal vault for the purpose of dissolving them, such as tincture of iodine, Monsel's solution, glycerine, or electricity. At the same time efforts at gradual reposition can be made. These should be sufficient to stretch the adhesions slightly but not enough to set up any inflammation.

When there are no adhesions, or after they have been absorbed, and the metritis, etc., cured, the uterus can be replaced and held in place in various ways. The least dangerous is by tampons, either of cotton or absorbent wool. These must be placed with a proper understanding of the mechanics of the condition to be remedied, or they may do more harm than good. The first tampon must be placed behind the cervix, high up in the posterior cul-de-sac of the vagina, making it impossible for the cervix to go back into its abnormal position. This will hold the fundus, the other end of the lever, in its proper place. Other tampons should be placed in the vagina in such positions as to fill it well and at the same time hold the first one in position. These can be

worn for from twenty-four to thirty hours, when they should be removed, and a thorough douche of hot water should be taken. This douche should be used two or three times daily until the next treatment, which should be in about three days. This method by tampons is the safest and most satisfactory, and it can be done at the same time that treatment is being given for any complications that may exist.

Pozzi recommends a soft-rubber ring pessary (Mayer's) to fill the vagina and hold it tense, and an abdominal pad applied just above the pubes to hold the fundus back in place. Anteversion pessaries have been invented by Graily Hewitt, Thomas, and Galabin, but none of them are completely satis-

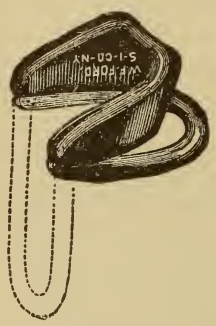

Fig. 56. Thomas' Anteversion Pessary.

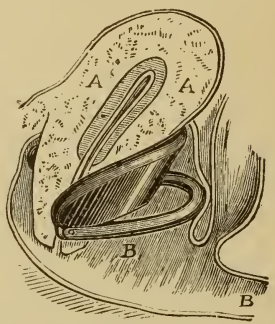

Fig. 57. Thomas' Anteversion Pessary in Position.

factory nor free from danger. In using pessaries the greatest care must be exercised in their selection and in fitting them, and they must be examined frequently to see that they are in proper position and are not causing erosion somewhere in the vagina. They need to be removed at frequent intervals and thoroughly cleansed. The soft-rubber ring pessary does not interfere with the woman's marital relations to the same

extent the hard rubber instruments do. Fecundation is possible with either. The hard-rubber instrument can be worn for a longer time without removal for cleansing. If worn too long a pessary may become imbedded in the tissues and cause much injury. This is more likely to occur in cases that are lost sight of for a time. They feel relieved from the symptoms and go on imagining everything is all right, until by and by they suffer more than ever before and apply for advice.

Thomas' anteflexion pessary (Fig. 56) is the best one in use. The uterus is first restored to its normal position, and

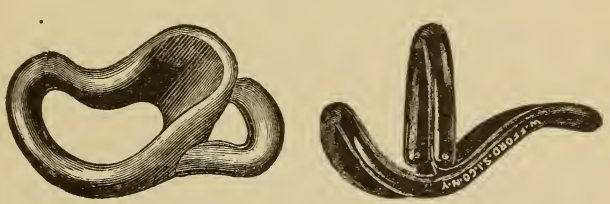

Fig. 58. Other Forms of Anteversion Pessaries.

then the pessary is introduced and placed so that the correct position is maintained (Fig. 57). Other forms of anteversion pessaries invented by Thomas are shown in Figure 58.

Anteflexion.—A few words on the shape and development of the uterus are needed for a correct understanding of the causes and treatment of anteflexion.

Causes of Congenital Anteflexion.—The normal uterus has been compared to a pear, the small end being downward. This resemblance is greater if the stem of the pear be drawn out, leaving a canal with an unbroken margin opening into the small end. As all have seen pears deformed by a "blight" or "knot" on one side, so the uterus may be deformed by a

failure in its development on one side. This is due to faulty nutrition at this point, and will cause the organ to bend toward that side. As these faults usually occur in the anterior uterine wall they usually result in anteflexions. This is the usual cause of "congenital" anteflexion. This want of development may occur at any time before puberty, but it more frequently occurs at or immediately before that time.

The uterus grows little from birth to puberty, being before the establishment of its physiological function an "infantile uterus." At this time it increases in size to that of an adult uterus in a very short time. This increase is found in both its corporeal and cervical portions. The body becomes longer and larger in circumference, and its cavity increases in length; it also rises higher in the pelvis, the point corresponding to the internal os being that part remaining nearest in a fixed position. Meanwhile the cervical portion has also been growing; prior to this period it was small, conical, and very little depressed below the vaginal roof; but now it becomes rounder in outline, and grows longer by pressing downward, carrying the vaginal mucous membrane with it. The opening to its canal becomes larger, and the canal itself is longer. The corrugations in the mucous membrane within the cervix deepen, forming the *arbor vitæ uterinus*. These are the conditions when the development is normal, but any cause preventing a free circulation of blood to nourish the uterine wall will result in impaired development of that side, while the rest of the organ grows to its normal size; the result is a congenital anteflexion. A congenital retroflexion might occur in the same way, but it is rarely met with.

Causes of Acquired Anteflexion.—Other causes of anteflexion are frequent in parous women, the congenital variety being more frequently found in nullipara. Among the causes of acquired anteflexion subinvolution ranks first. This is often the result of an abortion at which there was slight sepsis causing a metritis, thus preventing the return of the uterus to its normal size. Want of involution of the posterior wall may be due to the attachment of a piece of retained placenta at that point, the involution of the rest of the organ going on in a normal manner and producing anteflexion. The other great causes of anteflexion are found in the sequelæ of gonorrhœa,—as metritis, salpingitis, and pelvic exudations forming adhesions around the uterus. Occasional causes are mollites uteri; falls, especially if she alights on the buttocks; sudden strain, as from lifting; catching cold, producing uterine congestion, usually the result of indiscretions at the time of menstruation; tumors of the body of the uterus or behind it pressing it forward.

The Symptoms of congenital anteflexion form a marked contrast to those from the acquired variety. The clinical picture is entirely different. Women whose uteri are abnormally bent forward from a time prior to the inception of uterine activity are usually young when they come to the physician's hands for aid. They are anæmic, and usually poorly nourished, though they may incline to stoutness if chlorotic. There is often scanty menstrual flow of a light color, and it may be absent entirely; in some cases there is an extensive flow due to the thinness of the blood. Dysmenorrhœa is common, and lasts until the flow is fully established; this is generally with the passage of a clot, and may

be accompanied by some febrile action. The pain is often so intense for a few hours as to cause her to go to bed, where she lies in a doubled-up position until the clot is passed. She then can arise and be in comparative comfort until the next period comes round, when she again must take her bed and suffer. If a number of clots are passed several paroxysms of pain will be present during an interval lasting a day or more. There may be leucorrhœa, which can be accounted for in most cases by other causes. It is frequently the leucorrhœa so often found in poorly nourished young women. A most annoying symptom is irritability of the bladder, which is due to the fundus pressing upon that viscus, causing frequent micturition with all its inconveniences. There may be dysuria at the same time. If the patient is a married woman she will find herself sterile in many cases and will frequently develop dyspareunia. If she has not suffered before her marriage from "nervousness" she soon begins to have this most annoying of maladies as a result of the increased activity the marital condition induces in her pelvic organs. This may show itself in the form of "nerves," hysteria, or neuralgia, or it may produce epilepsy, all of which are increased at or immediately before the menstrual period. These neurotic symptoms are due to irritation caused by the presence of an unyielding point in the uterine wall. They are of the same nature as those produced by a cicatricial plug in the cervix, which is so frequently found in women who have borne children, and are from a precisely similar cause. When the anteflexion is associated with relaxation of the uterine ligaments these nervous symptoms may be, in part at least, due to the excessive mobility of that organ.

Anteflexion of the acquired variety when due to the results of parturition or gonorrhœa is sometimes found without any symptoms being complained of; but there is usually found to be leucorrhœa, bearing-down pains, backache, pains in the pelvis, and inability to retain the urine until the bladder is full. Dysmenorrhœa and painful coition may also be present, and the impaired activity of the nervous system may manifest itself; but some of these symptoms at least are due to other causes, as metritis, laceration of the cervix, or salpingitis.

The Cause of the Dysmenorrhœa is in dispute. It is thought by many to be due to mechanical interference with the passage of the blood produced by the bent and usually stenosed canal, which causes the pain to be so intense at the beginning of the flow and less after the canal has been dilated by the passage of a blood clot. To this idea is opposed the fact that cases of anteflexion with stenosis do exist in which menstruation goes on for many years without any pain whatever, the menstrual blood seeming to be able to pass through a very small opening freely enough to prevent its accumulation in the uterine cavity. The failure of the blood to form a clot in these cases may account for the absence of pain. The view more in accordance with the knowledge of to-day is undoubtedly true, at least in part. It teaches that the undeveloped part of the anteflexed uterus is unyielding, and when the organ enlarges, as a result of the congested state present at the beginning of menstruation, this undeveloped part offers a resistance to this enlargement and causes pain. The anterior uterine wall is wanting in elasticity in all cases of congenital anteflexion and resists any effort to enlarge the uterus, producing pain.

The Cause of the Sterility usually found with anteflexion has also been in dispute, it being maintained by some that it is due to the mechanical interference with the entrance of the semen into the uterine cavity caused by the curved and narrow canal; to this is opposed the ease with which the spermatozoa are known to pass through a very narrow internal os, they having been found in the tubes of women who had died but a few days after a coition, in whom there was also found an anteflexion and stenosis so narrow as to cause surprise that anything could get through. It has always seemed to me that a more probable cause of the sterility is the faulty position of the cervix in the vagina. This is especially true where there is anteflexion of the neck of the uterus. The cervix is not in its usual place, well back in the posterior cul-de-sac of the vagina, with its opening facing backward; it is now directed more or less forward, and the opening at least is forward in its direction. This causes the cervix to be in a position where it is less liable to be bathed in the seminal fluid, and the entrance of the spermatozoa into the cervical canal and thence into the uterus is less likely to occur. No doubt each of these conditions acts as a contributing cause in many cases, but it is my impression that the latter is a more potent factor in the production of the sterility. This opinion is strengthened by the fact that those cases of anteflexion in which the cervix occupies such a position that the external os is sure to be bathed in the spermatic fluid at the time of its discharge into the vagina are the cases in which sterility is least frequently found.

On Examination the diagnosis is easily made out in most cases, but mistakes have been made by experienced examin-

ers. A classification of the different forms of anteflexion will aid in detecting this condition. The best is that of Thomas. He calls the three forms described "anteflexion of the body," "anteflexion of the cervix," and "anteflexion of both the body and the cervix."

In *Anteflexion of the Uterine Body* the examining finger will usually detect nothing abnormal at first touch. The external os and cervix will be normal, and the whole vaginal portion of the uterus is in its usual position or nearly so, the cervix pointing in the backward direction and being of normal size

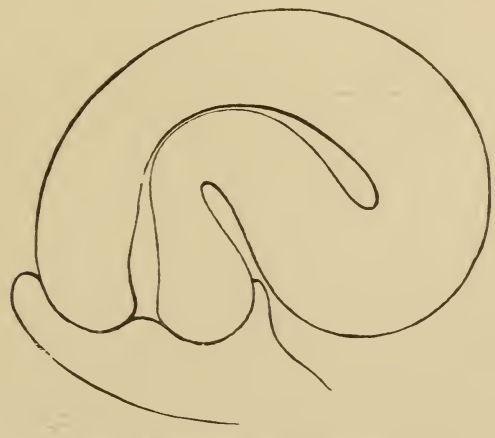

Fig. 59. Anteflexion of the Uterine Body.

and consistency. But when the finger is pressed upward by the side of the cervix, gently but firmly invaginating the vaginal mucous membrane and noting the consistency, size, and direction of that portion around the internal os and above it, it will detect a curve greater than should be, and in the anterior direction. Following the contour of the

uterine body, the finger will be partially withdrawn as it approaches the fundus, the anterior wall of which is found resting against the upper part of the anterior vaginal wall if the flexion is marked and the bladder is empty (Fig. 59). If the finger is pressed directly in front of the cervix it enters an angle formed by the flexion. Hardness of the undeveloped wall is also detected by touch, and is usually around the anterior part at the level of the inner os or just above it.

Probably the only condition liable to be mistaken for this form of anteflexion is a tumor in the anterior uterine wall, or a tumor in the pouch between the uterus and the bladder and adherent to the anterior wall of the uterine body; but neither of these conditions will be confusing to the examiner who follows carefully the method suggested above, remembering that the finger must pass to the *side* of the cervix and follow its contour upward or in whatever direction it may lead. This may be difficult to the beginner and the results obtained may at first be uncertain, but a few careful trials will enable any one to be positive of his ground and to safely and surely map out the position of the uterus almost to the fundus. If any condition be present making the pelvic floor thick and resistant, it will obscure the mapping-out process to an extent depending on the amount of thickening. In all cases where the least doubt exists the bimanual method must be used to clear up the diagnosis. A few cases will be met with in which even this method will not give positive evidence as to the condition. If doubts exist the sound must be passed, thus positively deciding the position of the uterus. Where the sound cannot be passed, or for any reason its use is deemed unsafe, examination by the rectum will add much

light to the knowledge of the condition and should be tried.

Anteflexion of the Cervical Portion of the uterus is evident on examination, as the finger detects the abnormal position of the cervix at once, pointing directly forward. Care must be taken, as before stated, to follow up the line of the uterus, locating carefully the position of the fundus, as the position of the cervix is near enough the same in each for a marked retroversion to be mistaken for this misplacement, or *vice versâ*. When the uterus is enlarged the bend at the internal os may be mistaken for the fundus; the finger by the side of the cervix will detect the difference at once.

Anteflexion of both the Body and Neck of the uterus is a combination of both of the above-mentioned conditions. The only point needing care in making a true diagnosis is that the examining finger be pressed up by the side of the cervix far enough to map out the position of the fundus correctly. A few points in the history of a case of this kind will be instructive. This patient had been examined by two prominent physicians in a neighboring city, one of whom is a member of the faculty of a well-known college there, and had been told by both that she had retroversion. This diagnosis she was more ready to accept as it confirmed a former one made by a physician in her native town in New England some years before. No treatment was made by any of these men for the local condition, and no sound was passed to verify their statement as to the position of the uterus. She suffered much pain, and was in bed about two weeks at the time of the last examination, during which time she was seen by two physicians, as above mentioned. Two months later

she came to New York, and being taken with an attack of her old trouble was brought to me. Her symptoms suggesting pelvic trouble, I suggested an examination, which was made. There was an anteflexion of the neck and body of the uterus present in a marked degree, with some sinking of the whole organ into the hollow of the sacrum. It was as clear a case as I ever saw. The only chance of mistake was in the fact that the uterus was somewhat enlarged, and the bend at the internal os gave to the finger an impression much like that of the fundus in retroversion. This diagnosis would be more readily accepted as she was a woman who had never borne children and her uterus might be supposed to be small. When the finger was pushed high up by the side of the cervix the line of the uterus could be followed the whole distance to the fundus, which was found in the anterior fornix, pressing against the bladder. The mistake made by these men was easy to make. The cervix pointed anteriorly, was long, and the bend in Douglas' cul-de-sac felt much like the fundus in retroversion. My universal habit of mapping out the position of the uterus by keeping the examining finger at the side of that organ saved me from repeating the error made by the others.

Exploration by the sound, and the result of treatment, which relieved all her uterine symptoms, verified my diagnosis, which was also corroborated by a prominent specialist in Boston, who was called in during a sudden attack she had while visiting that city some months later.

Anteflexion of both the body and the neck is sometimes confused with anteflexion of the body which has become retroverted. The cervix points in the same direction, and

the first touch is the same to the examining finger. The position of the fundus is not the same, it being upward in a position almost normal. If it were in its normal position the condition would be that of an anteflexion of the neck alone. The distinctive point in this condition is the fact that the uterus as a whole has changed its position in the pelvis; the anteflexed uterus has swung backward on the pivotal or fixed point, causing the cervix to move upward and forward. This complication needs no further mention here, as a knowledge of the true condition will cause the proper treatment to be used, which is, to treat the retroversion as any other retroversion after the anteflexion has been treated. There may be a prolapse of the whole uterus at the same time with the retroversion of the anteflexed organ; in fact, there usually is.

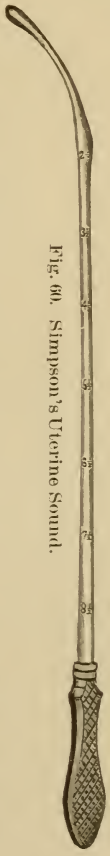

Fig. 60. Simpson's Uterine Sound.

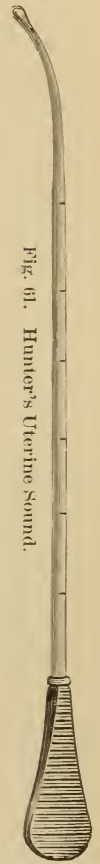

Fig. 61. Hunter's Uterine Sound.

Frequent mention has been made in the preceding pages of the use of the uterine sound. A few suggestions in regard to the use of this instrument are necessary. Figure 60 is Simpson's sound, one very commonly used. For convenience in measuring the length of the uterine canal this instrument is graduated. Hunter's sound (Fig. 61) is also much used; it is a smaller instrument. Sounds should be made of flexible metal, in

order that they can be molded to suit the direction of the canal.

Passing a sound into a normal uterus is not attended with much difficulty. But it must be understood that it is a proceeding not devoid of danger to the patient. I have seen much injury result from this seemingly simple procedure and several patients' lives put in jeopardy.

Some of the contra-indications to the use of the sound are recent pelvic peritonitis, suspected pregnancy, or fear of causing hemorrhage. The best time for its use is a few days after the menstrual flow has ceased.

In anteflexion the curve must be made considerably more than in retroflexion; the sound being flexible, its shape is easily molded by the fingers to any shape desired. The instrument may be passed with the patient in Sims' position or in the dorsal position. In Sims' position Sims' or Cleveland's speculum is used, while in the dorsal position a bivalve is necessary. It is possible to pass a sound without a speculum, but it is seldom necessary to do so. When a sound is to be passed without a speculum the dorsal position is the most convenient. The index finger is introduced into the vagina and held in contact with the cervix; the sound is taken in the other hand and introduced along the palmar surface of the finger that is in the vagina until it reaches the external os, into which it is guided by that finger-tip. No force should be used as it is gently carried along. When the sound has passed the length of the cervical canal and reaches the inner os, some resistance may be encountered, either from the curvature of the uterine canal or from a constriction of the internal os. The instrument may become caught in the rugæ in the endocervical mucous membrane at any point in

its passage. The obstruction can frequently be overcome by carrying the handle around in the arc of a circle in the manner which will be described more fully in describing the maneuvers employed in passing a sound in cases of anteflexion of the neck and body of the uterus.

If the sound is to be passed with the patient in the dorsal position through a speculum the method is comparatively easy. In this position the bivalve speculum is used. The sound is thoroughly cleansed, bent to the proper curve, and anointed with some lubricant. It is then introduced through the speculum by sight to the internal os. If the direction of the canal is known to be normal the point of the instrument should be forward as it enters the cervix, and it enters the uterus without obstruction by the depressing of the handle in the direction of the anus. Figure 62 represents a normal uterus into which a sound has been passed and is held with its point at the fundus.

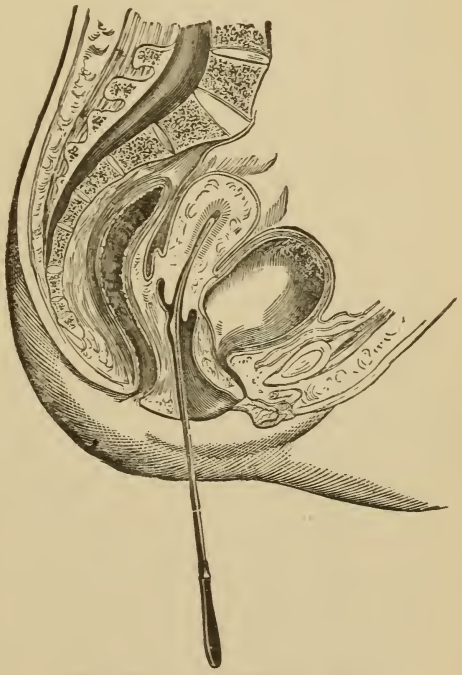

Fig. 62. Sound in Normal Uterus.

If difficulty is experienced in introducing the sound in the

manner above described, it is because of spasm at the internal os, stenosis of the cervix, or deviation in the direction of the canal. If spasm is the cause a firm, persistent pressure for a short interval will cause the circular muscles to relax, and the sound will then enter without further trouble. If stenosis is present the aid of a tenaculum may be required. This instrument may also be needed if the mucous membrane of the cervical canal is thickened by swelling. The thickening of the endocervical mucous membrane may interfere with the passage of the sound, either by increasing the depth of the rugæ or by narrowing the lumen of the canal. In the case when the end of the instrument gets caught in the folds of the swelled membrane, it is better to try to get past it by manipulation than to use force; but when the canal is simply narrowed by it some pressure may be used without injury. The tenaculum is needed to make counter-pressure when force is required. The tenaculum for this purpose should have a point with two angles, and should be strong and sharp. The instrument shown in Figure 63 has these necessary features. Figure 64 represents an instrument which has a curve instead of the angles, and is a form preferred by some.

Fig. 63. Tenaculum with Angular Point.

Fig. 64. Tenaculum with Curved Point.

When using the tenaculum its point is caught firmly in the anterior lip of the cervix from within the canal, and the cervix drawn downward and forward. In thus using

the tenaculum care must be taken to avoid two things: the first is taking too shallow a hold into the tissues of the cervix, and allowing the point to tear out making a ragged wound, and the other is allowing it to slip or tear out suddenly when the uterus has been drawn down, thus letting the womb return to its position with a sudden jar. The latter of these accidents is a frequent cause of inflammation around the tubes and broad ligaments, which is attributed to the act of passing the sound, although this act had nothing to do with the pelvic involvement. If much force is required it is best to stop, as injury may be done. Much can be done by changing the curvature of the sound, first bending it a little more and then a little less, until the right shape is obtained. The

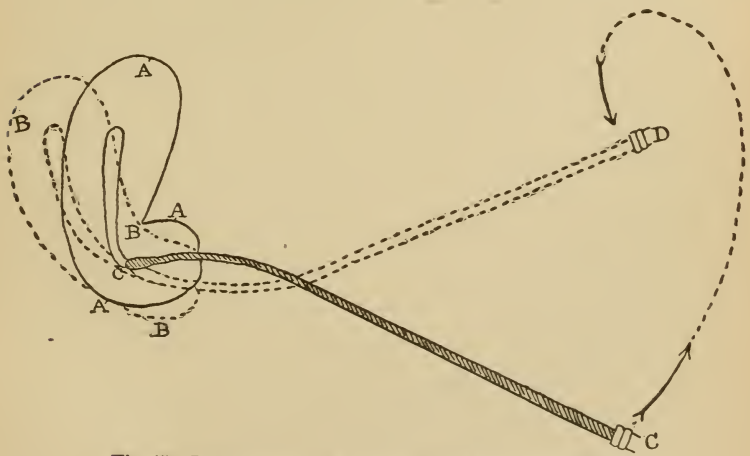

Fig. 65. Introduction of a Sound: First and Second Steps.

passing of the sound must be done slowly and with care; it should never be undertaken in a hurry.

When a sound is to be passed into a uterus with anteflexion

of the neck and body, some different manipulations are called for. The tenaculum may draw the cervix into position but cannot completely restore the canal to its normal shape. Some maneuver is necessary to get the point of the sound around the angle. I shall use the diagram in Figure 65 to show the first and second steps of this process. The sound is introduced with its point backward and caused to enter as far as the internal os. This brings it to the position CC in the diagram. The handle is then carried to the right, describing a semicircle CD. It is noted that the point of the instrument has not changed its position but has only turned upon its axis. The outer end of the cervix is depressed by this movement, lessening the amount of deviation from the normal in the direction of its canal. The third step is seen in Figure 66. The handle D is carried downward and backward to F, while the point goes from C to E, completing the introduction. It is evident from the diagram that the canal is

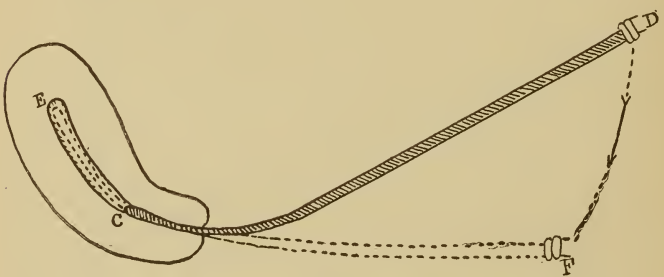

Fig. 66. Introduction of a Sound: Third Step.

straightened considerably when the sound reaches the fundus. Where adhesions exist binding the fundus down to the peritoneum between it and the bladder, this will stretch or

break them and may set up a pelvic peritonitis if too much force is used.

Where any variation from its normal direction exists in the uterus, various modifications of the plan described above may be successful.

Where it is deemed advisable to use a sound with the patient in Sims' position a Sims or a Cleveland speculum is used. A retractor is needed to push the anterior vaginal wall forward to get the cervix into view; when this is caught firmly by a tenaculum, the retractor is laid aside, or it may be held by an assistant if one be present. In this position the maneuvers are precisely the same as in the dorsal position. Change in the shape of the sound may be needed, turning of the sound handle to pass an angle may be indicated, or gentle pressure to overcome spasmodic closure of the internal os may be required. In all efforts at passing a uterine sound the greatest gentleness is necessary and no great force must be used. It is particularly dangerous to resort to any proddings or sudden jerking movements.

When the uterus has been entered the instrument must be passed slowly in, and the peculiar elastic sensation communicated to it by the fundus watched for. When this is felt all pressure must stop at once. The sound has frequently been passed through a soft friable uterus into the abdominal cavity. This accident may do little damage if the sound is small, but it is dangerous. A sound has also been passed out through a patulous tube; this is even more dangerous, as the opening is larger, making it easier for septic material to be carried into the abdominal cavity. It is well to remember that one tube may be so enlarged as to

be mistaken for a continuation of the uterine cavity; I have seen a curette passed into such a tube up to the handle. This accident may do no harm if the uterus is free from septis and the cervix is sufficiently open to drain it. The uterine probe (Fig. 67) is a smaller instrument, and can be used in the same way as the sound. If the cervix is very narrow it may be required, but it is more liable to get caught in the irregularities of the canal walls. The sound is the better instrument for general use.

Fig. 67. Wyeth's Uterine Probe.

The Treatment of anteflexion is largely mechanical. This is especially true of the congenital variety. The first care must be for adhesions binding the organ in its mal-position. These are only present where there has been a pelvic peritonitis.

If adhesions are found of sufficient strength to make their rupture dangerous, their removal must be attempted by vaginal applications of liquor ferri persulphatis, tincture of iodine, electricity, etc., followed by tampons saturated with glycerine or glycerine-borax solutions. These remedies have a solvent action on pelvic adhesions, and should be thoroughly applied to the vaginal vault two or three times each week. The vaginal mucous membrane must be carefully watched and applications made further apart if it is found much inflamed from the last treatment when the patient makes her next visit.

Proper placing of the tampons will aid the solvent action on the adhesions. They must be so placed as to cause the fundus to pull upon these bands, making them tense. This is done by following the instructions for uterine replacement. In replacing an anteflexion the finger presses against the posterior side of the cervix, drawing it forward and slightly downward. This causes the other end of the uterine lever (the fulcrum being near the internal os) to move backward and upward. If this mechanism is kept in mind no one will think of following the advice of those who sug gest putting the tampon in front of the cervix for anteflexion, as they say, to cause the mucous membrane of the anterior vaginal wall to *pull* the cervix after it. Who would use an elastic sheet to draw on his lever when he can get behind it and push?

From this it is plain that the main tampon to relieve anteflexion must go posterior to the cervix, and its size must be nicely adjusted to fit the place it is to occupy "snug," so as to exert some pressure. The fixed point for the tampon is the hollow of the sacrum, and it must be large enough to fill the space between that bone and the cervix.

After this tampon is in proper position others smaller in size should be placed about the vagina as room permits. They should exert some pressure on the vaginal roof and fill its cavity sufficiently to prevent the chief one from being displaced until it is removed. If properly introduced these tampons can be worn for from twenty-four to thirty hours. If the adhesions do not yield to the above line of treatment a few applications of galvanism *may* dissolve them, or cause them to become so attenuated that it is possible to replace

the fundus without setting up a new attack of pelvic inflammation. The electricity should be applied to the vaginal vault with a small metal electrode, the other pole being applied over the lower abdomen with a clay electrode or large abdominal sponge. The negative element is usually applied within, unless there is tendency to uterine hemorrhage, when the positive pole must be used within. It is frequently better to alternate the current, using one pole for a minute and then reversing for another minute. The applications should last from five to fifteen minutes, and sittings should not be given oftener than twice a week. The intensity of the current is best gauged by the patient, being always just a little less than painful. Should the electricity also fail to remove the adhesions, it may be necessary to give the patient ether, and passing a sound to forcibly raise the uterus from its bed and support it there on a stem of some kind. Care must be taken to ascertain if there is any tubal complication before this is attempted. While salpingitis is not a positive contra-indication to this operation, it renders it a much graver matter. These enlarged tubes may be imbedded in the adhesions, and their walls may be thinned by pressure from the accumulated pus within. Too forcible manipulation may rupture such a tube, causing a purulent peritonitis, which will rarely be confined to the pelvis. If the general peritoneal cavity should be invaded by this pus, a fatal result will usually follow. Those cases complicated by diseased appendages are best left without such radical efforts at replacement until this more serious condition is relieved.

Having succeeded in restoring the anteflexed uterus to its

normal position, the question arises, how to keep it there. The answer has usually been, a pessary; but no gynecologist of considerable experience is altogether satisfied with this appliance. It is yet a question if pessaries are not more of a curse than a blessing to suffering womankind.

Anteflexion pessaries have been invented by Graily Hewitt (Fig. 68), Thomas, and others; but many think that the time to use a pessary is when every other means has been tried and failed.

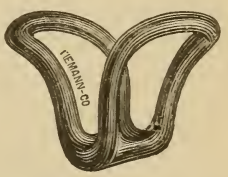

Fig. 68. Graily Hewitt's Pessary.

Wylie recommends the tampon to keep the uterus in its restored position. If these are applied as suggested above, bearing in mind the mechanics of the condition, much good will result. The tampons must not be too large, and a number of them thoroughly saturated with boro-glycerine solution should be carefully placed around the cervix, giving it support on all sides, enough of them being used to press against the bony pelvis all around. The precautions are to avoid direct pressure on the rectum or urethra, which might interfere with the evacuations from the bladder or colon. These tampons can be applied three times a week and worn about thirty hours. They can then be taken out before retiring, and a hot vaginal douche taken to give tone to the organs, followed by rest in bed, on the back if possible.

A few months of this treatment, if carefully done, remembering that each tampon is part of a piece of mechanism and has a duty to perform, will usually make a permanent cure, the ligaments having recovered their tone sufficiently to hold the uterus in its normal position, provided it has been

restored to its normal size and condition by relief of the metritis, subinvolution, or tubal disease that caused the malposition.

Congenital anteflexion has yet to be considered. It needs a special line of treatment because of its cause. There is a hard, undeveloped area in the anterior wall at and immediately above the internal os, as a cause of the faulty shape of the uterus. There is frequently a stenosis of the internal os and possibly of the whole cervix, with small "pin-hole" os. There may be elongation of the cervical portion of the uterus.

Treatment of congenital anteflexion with stenosis has two objects in view: to make the canal patulous by curing the stenosis, and to soften and develop the hard, undeveloped anterior wall. The stenosis is relieved by dilatation, either gradually or by rapid divulsion under anæsthesia. The anterior uterine wall is softened and caused to grow by causing an increase in its blood-supply to promote its nourishment.

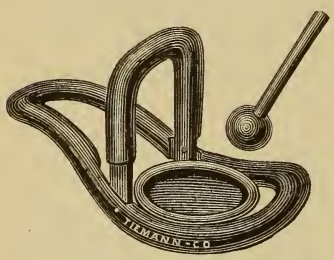

Fig. 69. Thomas' Uterine Stem and Pessary.

When rapid divulsion is done for the stenosis the uterus is raised to its natural position, and is retained either by a stem or a pessary, or both. The most popular stem is that of Thomas, which consists of a solid glass rod with a round, flat enlargement at its lower end. The end fits into a specially constructed pessary, which must be worn with the stem to keep it in position (Fig. 69). In order to meet the objection that this instrument may possibly close the canal and prevent the exit of the menstrual blood and other discharges,

vertical grooves have been made in its sides. If the contractions on the stem are great enough to cause retention with the stem, they certainly will be sufficient to press the soft mucous membrane into these shallow grooves and prevent them from acting as drains.

Thomas has devised a small instrument that he uses to enlarge the canal before introducing his stem. It is a probe-pointed instrument, with cutting edge on one side. He introduces this until its point is within the inner os, and makes a vertical incision the length of the cervical canal. This incision is usually about one eighth of an inch in depth. The instrument is then made to revolve one fourth of a circle and a similar cut made. Two more incisions are made, one opposite to each of these already described. It is necessary to do this operation under aseptic surroundings.

The position of the uterus is restored, the stem inserted into the canal and extending high enough into the uterus to hold it upright; the pessary is then inserted and adjusted to hold the stem in position. These stems can be worn for a number of months if they produce no symptoms. They need the care and precautions that must be observed with any pessary. Frequent douches are necessary to keep the vagina cleansed, and erosion must be watched for.

Professor Thomas has also made a "galvanic" stem to be worn in these cases.

Dr. Paul Outerbridge invented a wire drain for sterility and stenosis, which has also frequently been used as a stem for the cure of anteflexion. It consists of a continuous piece of gold wire so curved upon itself as to make a drain. Four vertical shafts of wire form the upright portion. These are bent outward at the upper end, where they form a loop at

either side, in such a manner as to form a projection which can rest above the constriction at the internal os and hold the instrument in place. The loops joining the lower ends of the vertical wires are bent to form a right angle with them, and by resting against the end of the cervix serve to keep the instrument from entering the uterus (Fig. 70). These drains can be made of sufficient length and weight to support the uterus in its upright position, though they were originally intended for the treatment of stenosis and resulting sterility.

Fig. 70. Fig. 71.

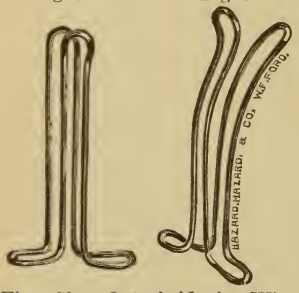

Fig. 70. Outerbridge's Wire Drain. Fig. 71. Outerbridge's Drain Bent for Anteflexion.

In order to meet the objection of possible sinking into the tissues which occasionally occurs with the wire drain when used as a stem, Dr. Outerbridge has recently perfected a stem on a similar principle. It consists of two lateral blades with outward curves at the points to catch on the internal os, and an angle at their junction to rest against the external os. Both of these instruments allow of perfect drainage and can be worn indefinitely. Being made of fourteen-carat gold, they will not corrode. They may be bent to suit the curvature of the canal where it cannot be completely straightened. Figure 71 is a gold wire drain bent to suit an anteflexion. When the uterus is raised from its anteflexed position a thorough curettement is usually of benefit. This will cure the metritis so frequently present. It should be followed by an application of carbolic acid to the denuded surface.

The nourishment of the impaired anterior wall can be improved by the frequent passage of sounds or graduated dilators, and application of tincture of iodine, either pure or mixed with an equal amount of creosote. These applications are made on a uterine applicator, one every third day. This treatment will also aid in the gradual restoration of the fundus to its normal position.

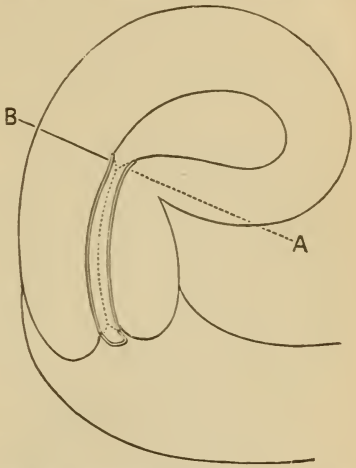

Fig. 72. Anteflexion of Uterine Drain in Position.

When a congenitally anteflexed uterus is straightened and a stem is not used to hold the organ in place, it can be retained either by tampons or pessaries, as has been described in the treatment of acquired anteflexion.

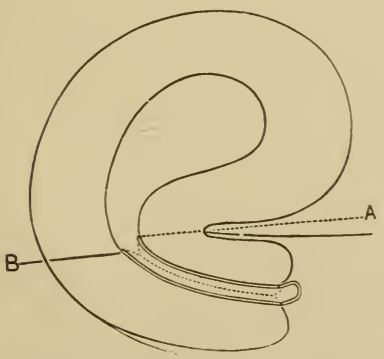

Fig. 73. Anteflexion of Body and Neck, with Drain in Position.

When the uterus is fixed in its abnormal position it may be best to introduce a drain to relieve the dysmenorrhœa, and let her wear it leaving the anteflexion unreduced. An anteflexion of the body is thus relieved in Figure 72, and an anteflexion of both the body and the neck is treated in like manner in

Figure 73. An Outerbridge drain curved to fit the canal is used in each case.

When the anteflexion of the body and neck is extreme and cannot be restored, some operation may be required. This is especially the case when much pain is present at each period and a drain cannot be introduced. In cases of this character Emmet advises discission on the lines indicated in Figure 74. By this operation an artificial external os is made on the posterior wall of the cervix. A drain or stem is needed to keep the new canal from uniting. Amputation of the cervix is claimed to be even better for these cases than discission. It is a simpler operation.

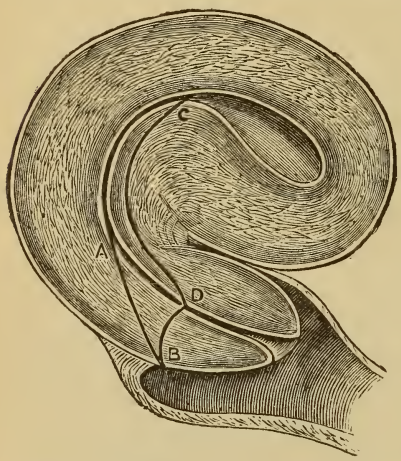

Fig. 74. Discission for Anteflexion of Body and Neck.

Posterior Deviations of the Uterus.—Retro-displacements are the most frequent deviations met with. They are either retroversions or retroflexions, the latter being much more common than the former. The uterus, as has already been stated, is held in place by the broad, round, and utero-sacral ligaments. These ligaments all contain a certain amount of muscular tissue, making them elastic. When for any reason this muscular tissue loses its tonicity, the ligaments offer less resistance to any effort to displace the uterus, and displace-

ment results in a direction dependent on the ligaments involved and the force tending to make it. One cause of loss of tone in the ligaments is overwork due to excessive drawing upon them, usually caused by a metritis following subinvolution or other cause, or the sagging of large heavy appendages. Another common cause is atrophy of the ligaments, the result of a general condition of mal-nutrition and flabbiness of the muscular system of the whole body. This atrophy may also be due to tension resulting from a misplacement caused by sudden accidental force and remaining unreduced.

Retroversion is a retro-displacement of the uterus in which the fundus is turned backward without the organ being bent at any point. The axis of the retroverted uterus is a straight line, but has ceased to occupy its normal relation to the axis of the pelvis. There are various degrees of retroversion, usually spoken of as first, second, and third. They are of no special importance except for clinical records. In Figure 75 the uterus is retroverted in about the third degree.

Fig. 75. Retroversion.

Causes.—Retroversion may be caused by metritis, due either to subinvolution or other cause. The weight of the enlarged fundus overcomes the resiliency of the round ligaments, which lose their elastic force from the prolonged stretching. The drawing of heavy displaced appendages may produce the same result. Other causes are prolonged rest on the back, as in long illness, falls, alighting on the buttocks, or tumor of the fundus or body of the uterus.

The retroverted uterus may be bound down by adhesions that have resulted from a peri-salpingitis or pelvic peritonitis. This pelvic inflammation is in many cases a sequence of the same tubal disease that caused the displacement by the heavy appendages drawing the fundus out of its normal position. The organ may also become fixed by enlargement after displaced, its return to a normal position being prevented by its increased size.

Symptoms.—There may be pain if the version is suddenly acquired, but frequently the only symptoms present are those due to the condition causing the retroversion. The complicating metritis or pelvic inflammation usually present will account for all the symptoms found. Sterility is usually present with retroversion, and there may be tenesmus of the rectum or bladder.

The Diagnosis is usually plain on examination. The finger in the vagina meets the cervix, pointing anteriorly toward the vaginal outlet. The fundus is found far back in the posterior part of the pelvis. There is no angle in the uterine axis, as mapped out by the finger at the side. If movable, the uterus can be tipped forward by pressing downward and backward on the cervix. If there is fixation it cannot be so replaced. In these fixed cases there may be doubt as to the diagnosis, as the mass behind might be a tube, a hydrocele, a fibroid, a mass of peri-uterine inflammation, or an abscess. The fluctuation in the abscess or from fluid pent up in a tube will, when detected, prevent these conditions from being confused with retro-deviations. If doubt exist, a rectal examination will often enable the fundus to be made out in the cul-de-sac of Douglas. If this does not make the diagnosis

clear, the bimanual examination or examination with the sound will remove all uncertainty as to the condition. The latter instrument gives evidence that it is unmistakable. A mass of feces in the rectum has been mistaken for the fundus in retro-displacement. It is evident that a rectal examination was not made when this occurred.

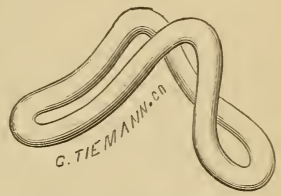

Fig. 76. Thomas-Hewitt Retroversion Pessary.

Anteflexion of the cervix has been mistaken for retroversion, and *vice versâ*, the position of the cervix being about the same in each. This error cannot occur when the position of the fundus is made out, as it always should be before the diagnosis is decided upon.

Treatment of retroversion is the same as retroflexion, except occasionally the angle in the latter requires some additional

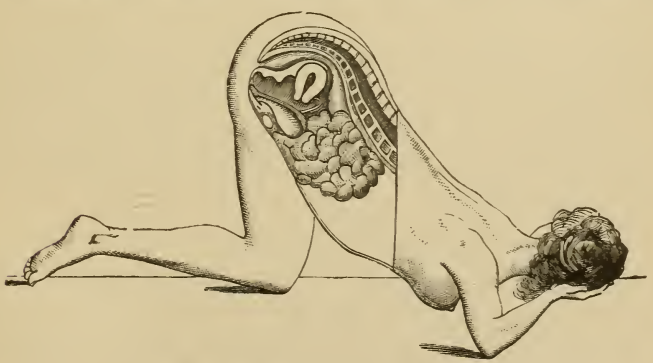

Fig. 77. Retroversion before Restoration.

consideration. Thomas' modification of Hewitt's pessary (Fig. 76) is frequently worn with benefit. The position may be restored by placing the patient in the genu-pectoral posi-

tion, as shown in Figures 77 and 78, or by the pressure of a finger on the anterior of the cervix. The organ can be retained in its normal position by tampons or by a pessary.

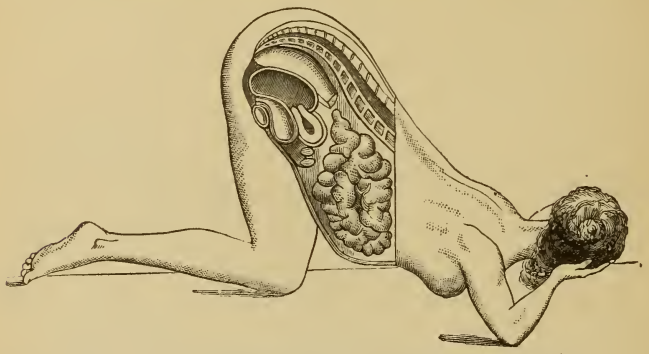

Fig. 78. Retroversion replaced by Genu-pectoral Position.

Retroflexion.—The uterus is displaced backward and at the same time bent upon itself when retroflexion is present. A frequent position is for the fundus to fall over into the cul-de-sac of Douglas, the cervical portion remaining in its normal position (Fig. 79). When the fundus is further depressed there is usually some change in the position of the cervix. It is carried forward and upward into the anterior vault of the vagina.

Causes.—Retroflexion differs from anteflexion in that it is rarely congenital, though it may appear in the virgin from metritis, constipation, or masturbation. The majority of cases is due to causes following pregnancy. E. Martin claims subinvolution of the anterior uterine wall, due to attachment of the placenta there, as a cause. The weight of the uterus immediately after delivery may cause retroflexion if allowed to act continuously. A case of primapara under my care

persisted in remaining in bed for three weeks after her child was born, and was on her back almost all that time. She had no mal-position prior to her accouchement, but got up with a marked retroflexion without tubal disease, metritis, or subinvolution. There were no adhesions or other complications, and no causal factor but the prolonged rest on the back could be found.

Relaxation of the broad and round ligaments lessening the supports of the fundus, while the stronger utero-sacral ligaments hold the cervix in position, is the usual condition

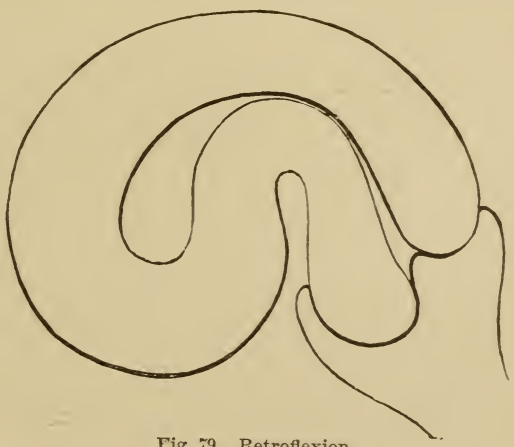

Fig. 79. Retroflexion.

found in retroflexion. The causes of this relaxation are a too heavy fundus, displaced appendages, or impaired general nutrition. If the appendages have not been displaced before the uterus causing the retroflexion, they may be drawn down with it into Douglas' pouch and become involved in adhesions there. These bands of adhesions are frequently strong and firm, and may bind the fundus, the ovaries, and the

tubes firmly together. They may draw upon the nerves and produce many of the symptoms of reflex nature commonly met. Paraplegia has been produced in this manner. Irreducible cases are as a rule complicated by salpingitis, the adhesions being due to inflammations around the tubes gluing the parts together.

The Symptoms of retroflexion are the usual symptoms of uterine disease, called by Pozzi "the uterine syndroma," and elsewhere described, nervous reflexes, and sterility. Obstinate constipation and the fecal anæmia of Sir Andrew Clark are common, the one being a sequence of the other. Statistics also show that about ten per cent of the women with retro-deviations have excessive loss of blood, either as metrorrhagia or menorrhagia. It is a question if the cause of the hemorrhage causes the misplacement, or if the extra loss of blood is a result of the faulty position of the uterus.

The nervous reflexes may assume one of many forms. There may be neuralgias, "nervous" coughs, dyspepsia, hysteria, chorea, asthma, vomiting, aphonia, hystero-epilepsy, or paraplegia. The latter will interfere with walking and confine the patient to bed or to her chair. All of the above conditions have been observed with retroflexion and have ceased after straightening up the uterus.

Sterility is common, but should pregnancy occur it may cure the condition, provided the adhesions yield. If they are firm enough to prevent the rise of the fundus out of the pelvis, abortion will result, leaving the condition worse than before the pregnancy occurred.

The examining finger detects a tumor in the pouch of Douglas and also notices the absence of the fundus in its

normal position. Unless there is much thickening from adhesions, there is no need of a bimanual examination or the sound to make the diagnosis perfectly clear. The outline of the entire uterus can be accurately made out with the one finger in the vagina, so that no doubt should remain in the mind of the examiner. The angle near the position of the internal os distinguishes it from a retroversion. The position of the cervix is also different from the latter condition, being normal or nearly so.

If doubts exist, rectal examination should be made to remove them, and when necessary the hand on the abdomen or the sound can be used. It is well to note the amount of retroflexion existing and the mobility of the uterus at the same time. The degree to which the organ can be moved is ascertained in the same manner as in retroversion, by pressure upon the anterior of the cervix. The amount of lateral motion produced by pressure can be learned by the finger at the side of the angle.

Treatment.—If the retroflexed uterus is bound down by adhesions these must first receive attention. The manner of their absorption and the remedies most likely to produce this result have been described under the treatment of anteflexions. The complications must receive treatment at the same time. Metritis may call for intra-uterine applications as already detailed, and curettement may be necessary. When the latter treatment is resorted to the endocervical mucous membrane must receive attention as well as that lining the fundus and around the internal os. This should be followed by a thorough application of some caustic to the entire surface denuded. The best remedy is carbolic acid, either pure

or dilute one half with glycerine. If the cervix has been lacerated it must be treated after the manner described in the chapter on metritis. After intra-uterine applications a patulous canal must be provided by dilatation if there is stenosis, or by avoiding too radical closure if sutures are required. All these manipulations must be done with the utmost gentleness, to avoid any possibility of starting up inflammation in the pelvic peritoneum.

Salpingitis and pelvic peritonitis must receive hot douches, iodine and creosote to the cervix and vaginal roof, glycerine tampons, etc., until all acute symptoms have ceased before any active interference is begun. Unless urgency of sepsis in the uterus exists, there is always time to await the relief of the acute tubal and peri-uterine inflammation before interference with the endometrium. After the adhesions are absorbed and the metritis and cervical conditions have all been relieved the question of reposition requires consideration. There are various methods of replacing a retro-displaced uterus. The first attempted should always be the manual. This is done in the following manner, and in uncomplicated cases is usually successful. The level of the internal os is nearly a fixed point, made so by the utero-sacral ligaments, and pressure downward and backward on the anterior of the cervical portion will usually cause the fundus to swing upward into its normal position. If the angle is a rigid one the cervix will be pushed into an abnormal position at the same time and will need to be straightened either on a sound or a stem. The fundus may not start upward freely, when the cervix is pressed downward and backward. More pressure may be required than seems justifiable. In

this case the finger may be passed deeper into the vagina and the fundus started out of its bed in Douglas' cul-de-sac. If the vagina is capacious two fingers may be introduced, and the index finger applied to the cervix to depress it while the longer middle finger raises the fundus. This method will usually suffice to reduce any retro-displacement that is free from adhesions.

If the vagina is small and the fundus seems caught under the sacral prominence, a finger in the rectum may aid in pushing up the fundus. A finger of the same hand is inserted and the perineum depressed by the web between the finger in the vagina and the one in the rectum.

When the uterus cannot be replaced by one hand alone there is one of two things to do, depending on the case. If the patient is stout, with large, thick-walled abdomen, more can be done by placing her in the genu-pectoral position (Fig. 78). The vagina is then opened with the fingers or Sims' speculum by raising the perineum and allowing the air to enter. This gives the force of gravity a chance to act, and the abdominal contents fall toward the diaphragm, and may restore the uterus to its normal position at once without further aid. Should it fail to do so the finger or fingers in the vagina will now find little difficulty in replacing it, though the additional finger in the rectum is sometimes required even in this position. Corsets and bands about the waist must be removed to get the benefit of the position.

Should the woman be thin, with flabby, easily depressed abdominal walls, the other hand on the abdomen may be called to aid the finger below, after the manner of a bimanual examination. The hand on the abdomen seizes the fundus

and draws it forward into a position of exaggerated anteflexion. This can be done with the patient either in Sims' or the dorsal position. It is difficult, and causes much discomfort if the patient be very stout or has rigid abdominal walls.

Another method of reposition often used is with a sound. This should be done with all the precautions usually required for introducing a sound. The vagina and cervix must be thoroughly cleansed and made aseptic, as must the instruments and towels to be used and the hands of the physician. The sound is bent in a slight curve and introduced to the fundus with the curve backward. The end of the sound is then made to describe a half-circle, bringing the fundus around anteriorly. This must be done slowly, and the arc described by the handle must be just large enough to allow the point of the sound to pass round in a smaller semicircle, causing no motion at the inner os. After the semicircular movement is complete and the fundus is raised and forward, the handle can be depressed toward the perineum, giving the uterus a position of exaggerated anteflexion.

This last method can be used through the bivalve speculum with the patient in the dorsal position, or with Sims' speculum with the patient in either Sims' or the genu-pectoral position. More force can be exerted with the sound than by the other methods, and the possibilities of setting up inflammation in the parts surrounding the uterus and its appendages are correspondingly greater. The sound should not be used in cases where the tubes contain pus or other pent-up fluid, or where there is acute peri-salpingitis. A large smooth sound should be used.

Emmet and Jennison (Fig. 80) have each invented an instrument for correcting uterine flexions. The former is called a "repositor," the latter a "sound," which can be used as a repositor. Dr. R. A. Kingman has combined the advantages of both in a repositor bearing his name. Any of these instruments may be used, but a large smooth metallic sound will be found to answer all requirements.

Fig. 80. Jennison's Repositor.

Gradual reposition is best done with tampons of cotton or absorbent wool. Oakum is also used for this purpose Manipulation with one or more fingers in the vagina can be used at the same time before applying the tampons. The pressure exerted by the fingers must be gradual and not forcible. No abrupt force should be used. The cervix is pressed upon in a way to cause the fundus to draw upon the adhesions and attempt to rise from its bed to the normal position. Further pushing movements at the point of adherence directly against the fundus can be made also, either through the vaginal or rectal wall. These efforts must be persisted in at each visit for weeks, and each time be followed by tampons to exert milder but prolonged pressure. Treatments should be had two or three times a week. After several months the adhesions will give way and complete reposition will be accomplished.

This *uterine massage*, if applied with judgment and patience, is apt to produce good results, as it restores tone to the parts as well as stretches and attenuates the adhesions. It is a very good adjuvent to the treatment with tampons. It is useful in all displacements of the uterus. Its chief danger is in cases complicated with pyo-, hydro-, or hæmato-salpinx with thin walls, or with pelvic abscess, where there is danger of rupture into the abdominal cavity. These conditions must all be removed before attempts of any kind are made to remedy the displacement.

If it is necessary to dilate the cervical canal for stenosis, it is usually best to use a blunt curette thoroughly over the whole uterine cavity, including the parts in the lower segment and in the cervix. Of course this will only be done under the usual precautions and after removal of the usual contra-indications (see metritis), and under an anæsthetic.

Having replaced the uterus, the next consideration is how to keep it there. The same is true here as of anterior displacements. The pessaries in use are not satisfactory. Pozzi recommends a ring of soft rubber to inflate the vagina. His translator objects to this inflation or stretching, and advises a Hodge. Professor Wylie objects to either, and advises the use of tampons. It is rare to find two authorities agree on this subject except when they are pupils of the same teacher or one the pupil of the other. The theories of what a pessary is to do and the mechanism of doing it are as various as their advocates.

Having no desire to advocate any, and with no pet theory to ventilate, it has seemed best to give brief mention of a few and their claims. I must remark in passing that the

careful and persistent use of tampons frequently applied has given me most satisfactory results. To get good results with a pessary or other appliance, exact knowledge of the cause of the misplacement, followed by a careful adjustment of the appliances to the size and shape of the parts, is a *sine qua non*. Hence trial pessaries should be flexible, and the physician should learn to mold them to suit the case. The most frequently used for this purpose is a ring of copper wire covered with rubber. A ring of flexible tin is also convenient. This is molded by the hands of the physician, and when the correct shape is obtained a rubber instrument can be ordered and made from this model. Figure 81 is a flexible metal ring covered with soft rubber, and can be molded by the physician's hands.

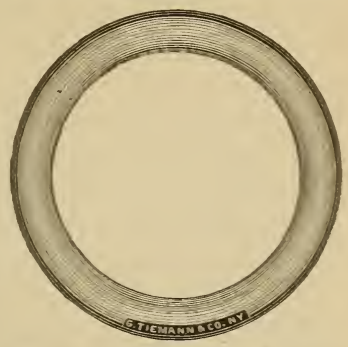

Fig. 81. Flexible Ring for Molding Sample Pessary.

Instruments for measuring the depth and width of the vagina have been invented. The length is usually taken in a straight line from the point behind the cervix where the vaginal wall unites with the cervix to the hymen at its point of union with the anterior vaginal wall. This distance can be measured on a sound or applicator, or, even better, on the index finger and hand, using the same thumb to indicate the point where the hymen or its remains touch the hand when the tip of the finger is at the posterior wall of the cervix.

The width can be estimated by two fingers in the vagina,

but better by Baker's vaginometer. It should be measured at the cervix, the middle of the vagina, and at the entrance just within the hymeneal ring.

The curve of the pessary depends on the work to be done by it and the position of the uterus. If there is simple falling a very straight one is usually advised, while if the flexion be marked a greater curve is made in the instrument used to correct the displacement.

The theory of retroflexion pessaries needs a brief mention. Almost, if not quite all, instruments made for this purpose are constructed with the idea of acting behind the cervix. For instance, Albert Smith made a retroflexion pessary with double curve, the posterior bar to fit the posterior vaginal fornix; Thomas modifies it by making this posterior bar thicker; Mundé further changes it by making the whole pessary shorter and thicker. Figure 82 is Emmet's modification of Smith's pessary. The same idea runs through all these instruments, which is to keep the uterine fundus in place by acting from *behind*. Some seem to think this is done by the instrument pushing directly against the posterior part of the uterine body, holding the organ upward and forward, while others claim to attain the result by making the posterior vaginal vault tense and causing its anterior folds of mucous membrane to draw the cervix backward and upward by its attachment to this the lower end of the uterine lever. It is even further claimed that relaxation

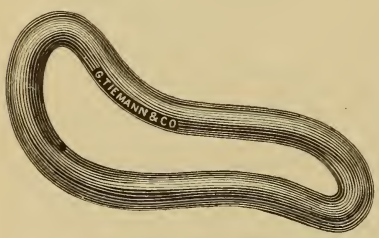

Fig. 82. Emmet-Smith Pessary.

of the utero-sacral ligaments may be rectified by the posterior bar of the pessary pushing upward and making them tense. Still others claim good from the pressure of the side-bars of the pessary on the side of the vaginal vault acting on the relaxed broad and round ligaments, and there are

Fig. 83. Inflated-Ring Pessary.

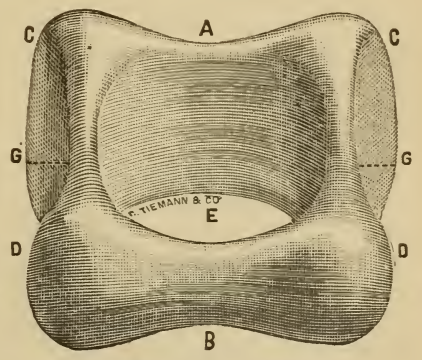

Fig. 84. Hoffman's Pessary.

those who maintain that the retroflexion pessary holds the retro-displaced uterus in place by exerting its influence more or less in all these ways mentioned. The inflated-ring pessary (Fig. 83) acts by expanding the vagina in all directions. Hoffman's pessary (Fig. 84) is used in the same way. Each of these instruments can be made larger or smaller by changing the amount of air within it.

My colleague, Dr. Paul Outerbridge, teaches yet another theory. He claims that retro-displacement must be corrected by force acting on the anterior of the cervix, and that it is better and easier to hold the fundus in place by pushing the cervix backward. He often uses a regulation anteflexion pessary for retroflexion, and claims better results than with the instruments made for retroflexion. My experience with tampons gives weight to the last-mentioned theory.

It is my practice to fill the anterior vaginal fornix first, in tamponnading for a retroflexion, and then place the remaining pledgets around the vagina in such a manner as to hold the first one in place and at the same time fully expand the vaginal vault on all sides. This acts by pushing the cervix backward, the pubic arch being the point of fixation for the anterior tampon, and at the same time gets the benefit of any action that can be exerted upon the relaxed broad and round ligaments at the sides. The results from these packings are usually satisfactory.

Flaccidity of the vagina, when present, needs treatment to restore the walls to their normal condition. Applications of liquor Monsel in full strength will often do this. These applications should be copious and be followed by the tampons placed as indicated. The tampons can be saturated with glycerine or may be applied plain. In many cases the latter way is better. One fact must be borne in mind in using the iron: it is a powerful astringent, and puckers the parts very much when applied, as it should be, generously, and the tampons used with it must not fit too tightly, or much pain will be caused when this astringent action draws the parts together over them. The tampons will be difficult to remove if the attempt is made before the action of the iron has passed off. Care must be taken also not to further dilate a capacious vagina by too much tamponnading. Atrophy of the vaginal walls can be produced in this way. Dr. F. Le Roy Satterlee has had made a powder-blower with which he fills the upper part of the vagina with powdered tannin through the bivalve speculum. He repeats this every third or fourth day, and claims good results without either tampon

or pessary. Several months' treatment is required for this method to relieve the vaginal flaccidity.

When all the complications have been relieved and the uterus replaced, if it fails to remain upright after treatment for a reasonable time a pessary may be the only resort left. There are cases where this is really the only thing to use.

After the instrument has been molded to fit it is introduced in the following manner. The upper bar, or that part which is to rest highest in the vagina, is held at the introitus, with

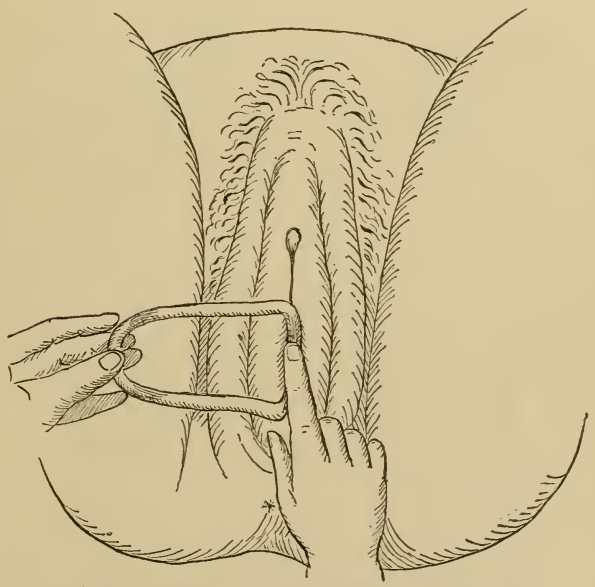

Fig. 85. Introduction of a Pessary: First Step.

the greatest width in the line of the vulvar opening. The lower end of the instrument is steadied with the left hand, while the index finger of the right hand is applied to the inner side of the upper bar (Fig. 85). By gentle pressure

the pessary is insinuated between the labia and carried into the vagina; as it passes higher it is gradually turned until it rests transversely when the bar reaches the cervix (Fig. 86). The bar is now depressed by the index finger so it does not catch against the cervix, and thus carried into the

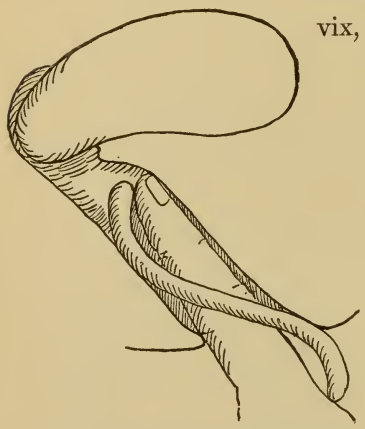

Fig. 86. Introduction of a Pessary: Second Step.

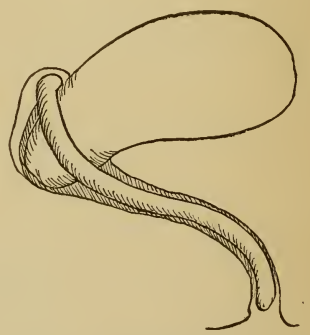

Fig. 87. Introduction of a Pessary: Third Step.

posterior fornix (Fig. 87). If the bar is to go anterior to the cervix the last movement is not needed. No pessary should be introduced until the mal-position has been rectified, nor while there is marked pain or inflammation.

Every patient who wears a pessary should be told she has one, instructed how to remove it, and told to do so whenever it causes any pain. She should use a daily douche of warm water containing sodium bicarbonate. Injections containing alum or any sulphate must be avoided, as they roughen the rubber. The instrument must be removed at frequent intervals and cleansed; the vagina should also be thoroughly examined for erosions at intervals.

Numerous *operations* have been devised for the relief of retroflexion. The simplest is probably that of Alexander. This consists in cutting down over the inguinal ring and finding the round ligaments; these are drawn down through the rings until they hold the fundus steady in a position of partial anteflexion and are fastened there by sutures. This is often successful, for the time at least, in restoring the organ to its proper position. The round ligaments may not adhere after the sutures are absorbed, or if attenuated they may lengthen and allow the fundus to sink back into its malposition again after a few months.

Better results are claimed by laparotomists when the abdominal cavity is opened and the round ligaments are sutured to the abdominal wall. They put the sutures through these ligaments close up to their point of attachment to the uterus and thus leave no chance for stretching. The result becomes a permanent fixation of the fundus in an upright position. Pregnancy has occurred and progressed to term without untoward symptoms in several cases under my observation in which this operation has been done. There has been no recurrence of the displacement in any of them after the pregnancy terminated.

Dr. Brathwaite has suggested and done an operation for persistent retroflexion which he claims will overcome the objections to Alexander's operation and yet avoid the necessity of opening the abdomen. His operation is done through the vagina. It is begun by making an incision in the anterior vaginal roof between the uterus and bladder. The bladder and urethra must contain a sound to avoid injury to them. The tissues are dissected up until the uterine wall

is bared on either side of the point where the peritoneum adheres to it. This point is lowest in the median line, and by going upward to either side the uterus can be exposed almost to the fundus. A stitch of strong silk is then put through the anterior wall of the fundus from side to side as high up as possible. The same suture is then passed deeply through the anterior wall at the level of the internal os. These sutures are drawn after the uterus has been placed in a position of anteflexion and tied, holding it there. The sutures are left to absorb.

Many other operations have been suggested for the relief of retro-deviations, but they have failed of permanent results. The cause of this in many cases is due to the fact that they have been attempts to fasten the organ to flexible parts, the most frequent idea being the formation of cicatrices in the vaginal wall or attachments to it.

Any operation or other procedure for retaining the uterus in its normal position must be preceded and followed by treatment to remove the causes. If the appendages have drawn it out of place by their weight, they must receive attention; if subinvolution and metritis have caused it to leave its normal position, they must be cured; and if the ligaments have failed to support it in place, treatment to restore their tone must be applied. All these things must be done thoroughly, persistently, and with a definite knowledge of the objects to be attained, and success will result.

Mollites Uteri.—Deviations of the uterus will not be complete without mention of "mollites uteri." This name was given to this condition by the late Dr. Charles D. Scudder, who was, I think, the first to describe it. This softening of

the uterus is most marked in its middle segment at and immediately above the internal os. At this point the organ is so flaccid as to offer very little resistance to the examining finger when pressed against it.

Symptoms.—The most prominent symptom is the variable position of the fundus. Examination at one visit reveals a retro-displacement, usually a flexion, and at some subsequent visit an ante-displacement will be found. There is usually a flabbiness of the ligamentous supports of the uterus as well, and there is rarely any peri-uterine complications, though the fundus is usually heavy from metritis. There is general flabbiness of the tissues of the body, particularly the muscular structures.

The Treatment must be general and local. The general treatment consists of tonics, as strychnia, iron, quinine, phosphorus, etc., accompanied by moderate exercise in the open air, good nourishing food, and such drugs as are needed to keep the alimentary canal in a healthy state. The local treatment consists of Monsel's solution of iron to the vagina, intra-uterine applications of tincture of iodine and creosote, if metritis is present, and tampons to steady the uterus in position. Hot-water douches in the intervals between treatments must also be given.

Displacement of the Uterus en Masse may occur. This is always a symptom of some other condition, and merits no consideration except appreciation of the cause. The displacement may be lateral, anterior, or posterior, and the cervix may be more removed from its normal position than the fundus, or *vice versâ*. Cicatricial tissue caused by healing lacerations involving the upper vagina is the most common

cause of the cervix being displaced. This always draws the organ toward the side on which it occurs. Tumors, either in the tubes or around them, act most frequently on the upper uterine segment. They cause displacement by pushing the organ to the opposite side of the pelvis. Displacements upward are always due to tumors, causing the pelvis to be too full, and merit no special mention.

Prolapse of the Genital Organs.—Under this head is included prolapse of the vagina as well as prolapse of the uterus, because the displacement of the vaginal walls, as cystocele or rectocele, frequently occurs first, the uterine displacement being a consequence of these conditions. Elongation and hypertrophy of the cervix might with propriety be also included under the same head, as it is intimately associated with this condition as clinically seen.

Causes.—Prolapsus is usually a result of pregnancy or of frequent pregnancies, and the greater the number of pregnancies in a given case, the greater the tendency to this condition. Violence, in the form of falls, may produce it, but is frequently only the last cause, favorable conditions for it existing as a result of frequent parturitions. A few cases of prolapse from falls occurring in a virgin are on record, but they are rare.

The great factor in downward displacement is laceration of the perineum destroying the perineal body. The external skin covering the perineum may be torn and remain apart without much danger of prolapse, but when the perineal body is torn falling almost always follows, sooner or later.

This perineal body is a wedge-shaped piece formed by the union of muscles from the sides of the pelvis, the symphysis

pubes, and the coccyx. This wedge supports the posterior wall of the vagina by continuity of tissue, and its anterior wall by contact, and through both walls it aids in the support of the uterus and its appendages. The loss of this perineal body removes the lowest element in this series of supports.

The mechanism of the perineal support of the uterus is evident from Figure 88, which was specially drawn for this work. The wedge-shaped perineal body is shown between

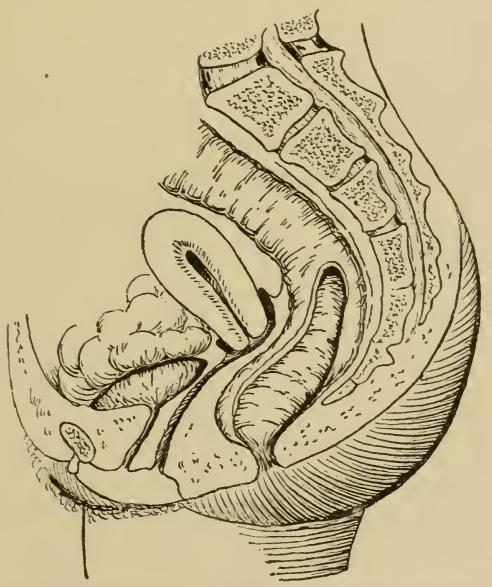

Fig. 88. The Perineal Body as a Support to the Parturient Canal.

the vagina and rectum. When a considerable portion of this is torn backward, the posterior wall of the vagina will be in the form of a double curve. Pressure from above will cause the lower curve to increase, causing a bulging downward of

the posterior vaginal wall. The result is prolapse with rectocele.

The first stage of prolapse is accompanied by rectocele or cystocele, or both. The presence of a small amount of cellular tissue between the walls of the vagina and rectum make prolapse of the posterior wall possible to a certain extent without carrying the rectum with it, while the intimate connection of the anterior wall of the vagina and the walls of bladder renders prolapse of the anterior wall without cystocele almost impossible.

At times the peritoneum is abnormally low in Douglas' cul-de-sac, and a fold of it is drawn down with the wall of the vagina and the rectum, complicating the rectocele; the cystocele may be complicated in the same way by a fold of peritoneum coming down posterior to the fold of bladder. This possibility of peritoneal communication should always be borne in mind in all operations or other manipulations resorted to for cystocele or rectocele, as the peritoneal fold in either may contain a loop of intestine which may be injured.

There may be prolapse of the vagina alone, or it may be accompanied by elongation of the cervix. This elongation may be sufficient to project beyond the vulva, the fundus occupying its normal position. The next step in the descent of the pelvic organs is misplacement of the uterus in a downward direction. Three degrees of descent have been described, but this division is arbitrary and needless. The uterus "falls," if not checked, until the cervix appears at the vulva. If the perineum is torn badly and no treatment is had, the whole uterine cervix may be beyond the labia

majora; but it usually returns within the vagina when the patient is in a recumbent position.

In very bad cases there may be partial or complete inversion of the uterus, varying from a slight depression of the fundus to the presentation of the endometrium lining the fundus at the introitus vaginæ as a rounded tumor. This inverted uterus has been mistaken for a uterine fibroid with a long pedicel, and operation has been attempted for its removal before the true condition was apprehended. As a rule, careful examination will avoid such disastrous blunders, as absence of the fundus in its usual position can usually be ascertained. Figure 89 is a uterus in an early stage of inversion.

Fig. 89. Inversion of the Uterus.

In all cases of pronounced downward displacement where the mucous membrane of the vagina covering cystic or rectal tumors or the cervix projects externally there is a tendency to erosion and the consequent formation of "ulcers." These are not ulcers in the sense that they are formed by any ulcerative process. They are simply raw surfaces where the mucous membrane is wanting, having been removed by friction or want of nutrition resulting from the abnormal position.

The ovaries may be involved in the prolapsus. The usual position of these organs when involved is behind the uterus, in the fold of peritoneum constituting the pouch of Douglas. In cases of inversion they are apt to follow the uterus into the depression formed by it; this is only common in cases of complete inversion, as they are at times held up by their liga-

mentous attachments even after the fundus is turned inside out. Prolapse of the ovaries may occur without displacement of any part of the parturient canal, and will receive mention in the chapter devoted to these organs.

Symptoms.—The diagnosis of downward displacement is often made by the patient herself. She feels the cervix or the prolapsed vaginal wall at the vulva, and comes for assistance, saying she has "falling of the womb." This statement of hers is often correct, but not always, as any other tumor presenting there will cause her to make the same statement. Occasionally there is no reason for her statement at all, as women have a dread of this condition and may be led to think they have it by their fears. Other symptoms complained of are backache and dragging pains in the pelvis, back, and inguinal regions, rectal and cystic tenesmus, and there may be dysmenorrhœa. Frequently there is too much blood lost, either by prolonged or copious menses or too frequent occurrence of the flow.

Examination.—If there is cystocele or rectocele a rounded tumor shows at the vaginal outlet on parting the labia, the crease showing the location of the vaginal canal being behind it in the former and in front of it in the latter condition. A sound passed into the bladder can be returned into the tumor when that viscus is involved, and a finger passed into the rectum can be carried around forward in the same manner when its anterior wall is involved in the tumor. The tumor can be readily pushed back by the finger, only to return when the pressure is removed. The rough transverse markings in the mucous membrane formed by the rugæ will help to distinguish it from other tumors presenting at the vulva.

The sound through the bladder or the finger through the rectum are diagnostic.

Digital examination will detect any displacement of the uterus, the cervix being found lower in the vagina than is normal. There is apt to be present a general laxness of the walls of the vagina and the uterine supports, allowing considerable liberty of motion to that organ and its appendages. If there is inversion the fundus will be missed by the finger in following up its side. Its absence will also be noticed on rectal examination, the abdominal hand will detect the "dip" in the fundus when examining bimanually, and the uterine sound cannot be introduced. A mucous fibroid at the fundus (Fig. 90) may create the impression of an inversion. The sound will be particularly liable to deceive in cases like the above. The hand on the abdomen will find the depression in the fundus if present, showing the importance of a bimanual examination in doubtful cases. If the inversion be far enough advanced the fundus may be felt presenting through the external os into the vagina as a rounded tumor, and resembles a polyp at times. Figure 91 is a fibroid at the cervix resembling an inverted uterus. A bimanual examination here reveals the fundus in

Fig. 90. Mucous Fibroid at the Fundus Simulating Inversion.

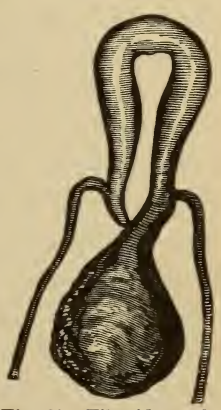

Fig. 91. Fibroid at the Cervix Simulating Inversion.

its normal position, and with patience a sound can be passed. The bimanual examination should be used and all other available methods of examining before a decision is made or treatment begun.

Treatment of the minor forms of prolapse is often successful without operation. It consists in reposition and support of the displaced organs, the application of remedies to restore tone to the relaxed supports, and the use of such means as are required to improve the general health.

The replacement of the organs is usually easy, and can be done with one or more fingers in the vagina. The reposition of inversion is more difficult, and will receive separate consideration later. Frequently the parts replace themselves when the patient is in the dorsal position. Reposition is aided by the knee-chest position, and often the patient can be taught to assume this position herself, admitting the air by separating the labia. This allows the parts to resume their usual position due to the action of gravity. A valuable auxiliary to other forms of treatment for misplaced genital organs is to have the patient place herself in this position several times daily and remain in it as long as she comfortably can.

The means of keeping the parts in their restored position are not so satisfactory. Pessaries are frequently used, but the same objections obtain in these cases as in antero- or postero-displacements. The tampons, properly used, are usually more satisfactory. This is more noticeably so as their use allows the frequent applications of remedies to relieve the relaxation of supporting parts. The tampons should be small, and placed about the vagina in such position as to

retain every part in its restored position. If there is prolapse of the posterior wall it must be drawn upon by filling the posterior fornix first. The anterior wall is held up in like manner by packing the anterior vault of the vagina first.

The introduction of the tampons must be preceded by the application of some astringent to the whole vagina. The best drug for this purpose is the persulphate of iron (Monsel). Tincture of iodine and creosote has some astringent action, and is more satisfactory in some cases when the iron causes pain or too much sloughing, but it is not as likely to penetrate deep enough to affect the ligamentous supports where they are relaxed, nor are its effects so lasting as the iron. The tampons should be saturated with the following solution:

℞
Alum.
Borax.
Glycerine ..... āā ℥ ij
M.

Where there is inversion the restoration is more difficult, depending upon the degree of inversion and whether there is prolapse as well. The inversion may exist when there is no displacement of the vagina, or it may be complicated by vaginal prolapse.

If adhesions have formed in the pelvis after the displacement occurred, it may be impossible to replace the uterus or to correct the inversion. When the inversion is partial it can frequently be pushed up by careful manipulation with one or more fingers in the vagina. If the inversion is complete Tait introduces a finger of one hand into the

rectum and the corresponding finger of the other hand into the bladder. These fingers are passed to above the point of uterine attachment to the anterior and posterior vaginal walls, and their palmar surfaces made to press downward at

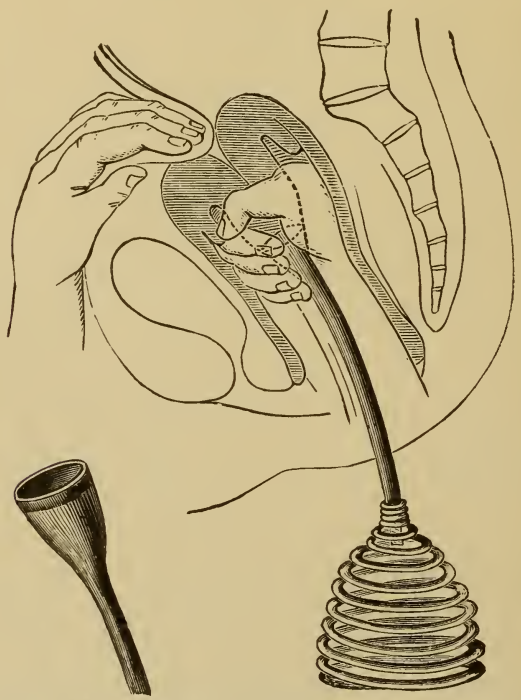

Fig. 92. White's Method of Restoring an Inverted Uterus.

these points to oppose the pressure from below. The thumbs of both hands are now applied to the inverted fundus and press it upward through the cervix to its normal position. White's method of restoring an inversion of the uterus and his instrument is shown in Figure 92.

If the cervix has contracted after the fundus is entirely

through it, it may be impossible to get the parts restored to their natural position. The cervical ring has been incised and the fundus pushed upward with the hand, allowing it to tear open as much more as is required. After the parts are replaced the laceration is repaired. This is a serious operation, requiring a skilled surgeon. The abdominal cavity may be opened in doing it. It may be wisest to do a laparotomy and attach the fundus to the anterior abdominal walls after it has been put up into its normal position.

Intra-uterine packing may be necessary to retain the position after it has been restored, and the endometrium should be treated as its condition indicates. In cases where the inversion cannot be corrected the fundus may be removed. In doing this the possibility of opening the peritoneal cavity must not be overlooked.

The use of a pessary or tampons presupposes the presence of at least a part of the lower segment of the pelvic floor, in which the perineal body is so important a factor. And this brings up the various methods of restoring the genital supports by operations.

The first and vastly the most important of these are those for restoration of the perineal body. It is not the object of this book to give in detail descriptions of important operations. Many good methods have been devised for closing lacerations of the perineum. The main desiderata are that the operation should be short, and that the muscular structures be thoroughly denuded and well united, making a compact perineal body. Complete junction of the skin makes a nice-looking result, but it may conceal a failure, just as an intact external perineum may conceal a tear that has destroyed

entirely the support of the vaginal wall. There may be prolapse of the vaginal walls, either anterior or posterior, due to laxness of the mucous membrane itself. Emmet's operation can be done in case the perineal operation is not indicated. Where the operation on the perineum is not sufficient to restore the vagina to its proper size this operation can be done at the same time. The plan is about the same for the anterior and the posterior wall. It consists in denuding an oval patch in the median line, at the level of the greatest relaxation. Smaller patches are now denuded on either side of this one, equidistant from it and at the same level. The stitches are so introduced as to cause these smaller denuded surfaces to be drawn in contact with the large surface, each small surface covering half the large one. When they have healed a pucker is formed, and the vaginal wall is thickened and drawn together thereby. This operation can only succeed when the cause has been removed. When this is not done the relief is only temporary, as the mucous membrane will soon yield to the forces acting upon it, causing a return of the trouble in the same manner as it originally came.

The operation described for the relief of vaginal prolapse is mentioned here simply as one of the best plans devised for correction of this condition. It shows clearly what such an operation should aim to do, and the most successful means of attaining that end. Many other methods have been suggested and employed with satisfactory results, but the same idea runs through them all. If done in conjunction with perineorrhaphy it will often be convenient to carry the denudation up on the posterior wall and make the line of sutures continuous.

The constitutional treatment requires the taking of tonics, especially nux vomica or strychnia, the general surroundings necessary to improve the general health, and especially to build up relaxed tissues. These remedies are especially indicated in cases of prolapsus where there is anæmia or a general flabby condition of the tissues over the body. They should be accompanied by baths, massage, faradism, and every other means indicated to restore muscular tone.

General treatment will do most in those cases where the organs can be returned to their proper position and retained by tampons, astringents, etc., as has already been described. Where there is general plethora and constipation, remedies for the digestion and liver are needed. As a rule, nothing better than the rhubarb, ipecac, and soda mixture given elsewhere can be used for these women. If the constipation is extreme, about a half-drachm of the sulphate of magnesia may be added to each dose for a time.

CHAPTER XII.

SALPINGITIS AND PERI-SALPINGITIS.

Salpingitis.—The diseases of the Fallopian tubes are rarely idiopathic. They are usually sequelæ of diseased condition elsewhere in the genital canal. The organ whose involvement in disease process is most frequently followed by tubal disease is the uterus. The tubal disease is usually inflammatory and always a result of infection by germs. The uterine diseases causing inflammation of the tubes are the various forms of metritis, those resulting from gonorrhœa, badly managed labor, and abortion being most common. The manner in which the infection reaches the tubes has already been indicated, as has the fact that both appendages are more apt to be involved as a sequel of gonorrhœa, while the post-puerperal cases are usually followed by infection of one appendage only.

Varieties.—The inflammation in the tubes is either catarrhal or purulent. The latter form must not be confused with pyo-salpinx, which is a very different condition. Gonorrhœal salpingitis is usually purulent, and may terminate in a pyo-salpinx. The symptoms of the two forms do not differ materially from each other except in the character of the discharge from the uterus. This discharge is of course modified by anything given off by the uterine walls. The discharge is

thick in consistency and contains pus when the salpingitis is purulent. When a catarrhal salpingitis exists the discharge may be transparent and is frequently stained with blood. The catarrhal inflammation is more frequently followed by a complete cure than the purulent form. The symptoms are generally milder when no pus is present in the tubes.

In purulent salpingitis there is generally an occlusion of the ostium abdominale, but the uterine ends of the tubes are patulous. The pus has free access to the cavity of the uterus, and a more or less constant stream passes from the tube. When there is also occlusion of the ostium uterinum a cyst is formed and a pyo-salpinx is the result. Gonococci may be found in the pus from a salpingitis of gonorrhœal origin, but inability to find them is not evidence that the infection is not gonorrhœal.

Acute Salpingitis is a result of an acute gonorrhœal infection of the uterus, spreading rapidly to the appendages. It may extend to the pelvic peritoneum and thence to the general cavity, causing all the symptoms of a general peritonitis. It usually subsides in a few days, and leaves a chronic salpingitis and ovaritis.

The Symptoms of acute salpingitis are those of acute inflammation elsewhere in the pelvis. There is local pain and tenderness, usually preceded by one or more chills. The fever following the chill may exceed 104° F. and lasts for several days. The local temperature in the vagina is higher than that of the general body temperature. There is leucorrhœa present in most cases, though this discharge may be suspended while the symptoms of general infection are most pronounced. When this is the case the temperature falls

immediately after the discharge returns. The infection from puerperal causes acts in the same manner, except that it is preceded by the puerperal condition with its symptoms.

The Treatment of acute salpingitis does not differ from that of acute metritis. Rest in bed, saline purgatives, and douches are essential, and fluid diet is necessary.

Chronic Salpingitis is much more frequently met with. It rarely ends in spontaneous recovery; in fact, only the most radical measures result in a cure, and then at the expense of mutilation. The symptoms of salpingitis are those of chronic pelvic inflammation. Ovaritis, when a complication, will add its symptoms.

Symptoms.—There is pain, which is frequently neuralgic in character and may be intermittent in its severity. It is usually located at the sides of the uterus and in the inguinal regions. The pain is usually worse at the menstrual period, though exceptional cases are met who feel better when menstruating than at any other time. Menorrhagia is almost always found, and irregularity in the time of the menstrual flow is frequent. Leucorrhœa is always present. It is usually copious, and may be periodic in quantity. The examining finger will detect the symptoms of the metritis or other complicating conditions present. The tube-like sensation the enlarged appendage produces is unmistakable. The tube is large and tender on pressure, and is usually lower in the pelvis than its normal position. This condition is difficult to make out in some cases when much inflammation is present around the tube. At times the tube is tortuous and much enlarged. When the cervix is inspected through a speculum

the character of the discharge is shown by the plug in the cervical canal.

Treatment.—To treat chronic salpingitis the utmost patience on the part of the physician is required. These cases go on improving for a time, and then, imagining they are well, they cease to come for treatment. The result is a suspension of care-taking and a consequent return of the symptoms. This recurrence may be a new attack brought on by over-exertion, or it may be only an increase of the discomfort caused by the old condition.

The treatment of chronic salpingitis is almost entirely local. The only internal medication is, that when there is much congestion of the uterus a free catharsis may be indicated. The first element in the local treatment is directed to the condition of the vagina and uterus. The most scrupulous asepsis must be maintained in these parts. For keeping the vagina in this condition frequent douches must be taken. The use of borax, sodium chloride, or other drugs in the douches may be indicated. The indications for these substances and the manner of using them has already been outlined in describing the treatment of vaginitis.

The cervix must be kept free from plugs of mucus, and patulous, and, if it can be done without danger of exciting acute inflammation, the endometrium should be treated. The treatment of the surrounding inflammation in the pelvic peritoneum will be described under that heading. The treatment directed to the condition of the tubes themselves claims attention. While the communication between them and the uterus is free the pus can make its exit from the tubes into the cavity of that organ. Efforts should be made to promote

this exit by every means available. If the tubes have become depressed in the middle, tampons can be so applied as to straighten them by raising the displaced portion. If they are displaced effort can be made to gradually restore them. Both of these things can only be done when the organs are free from surrounding inflammation so as to leave them freely movable.

When the tubes have been surrounded with exudation so that they are not movable little can be done for their replacement. The methods elsewhere advised for the absorption of the adhesions can be tried. All manipulations must take into consideration that the tubes are within the adhesions. The tube wall may be so thinned by the pressure from within that rupture may result from slight tension. If the tube is bound down in a position accessible from the vagina, it may be advisable to puncture the tube through the vaginal wall and drain it in that way. This method is more likely to be required for pyo-salpinx, and will be mentioned again.

Drainage through the cervix must be maintained, and at times the introduction of a drain in the canal is required. The gold wire drain of Dr. Outerbridge is the best instrument for this purpose (see Fig. 50, page 217). When the tubes show a tendency to close at their uterine ends something can, at times, be done to prevent complete occlusion. If there is entire absence of surrounding inflammation benefit may be obtained from these efforts. Curettement for this purpose is frequently done. The most rigid antisepsis must be observed in doing the operation. To obtain the benefit desired the part of the endometrium around each ostium

uterinum must be gone over a number of times. The dull curette is used. The endometrium must have the usual painting after the scraping, and an open cervical canal must be maintained.

Some surgeons have passed a sound through the opening directly into the Fallopian tube to secure drainage. This can be done, but it is not devoid of danger and it frequently requires much time to find the opening. A small catheter has been introduced in this way and the tube emptied. After this is done a washing of the tube could be done and remedies introduced into its cavity. The care about rupture and forcing open the sealed abdominal end must not be forgotten. The mucous membrane lining a tube in which a purulent inflammation has existed becomes a pus-forming membrane. Pressure or caustics are required to stop the formation of pus, which process will go on indefinitely unless the membrane is treated or the tube removed. If some tincture of iodine can be injected into a tube after it has been drained and washed out, there is some chance of preventing the further formation of the pus. Strong solutions of nitrate of silver will act in the same way and may give even better results than the iodine. The dangers and difficulties of these efforts at a radical cure are considerable, but the only complete cure by other methods is by removal. A laparotomy is also dangerous, and its dangers are much enhanced by the extent of adhesions in which these tubes are usually imbedded. The possibility of getting into the tube through the uterus is beyond dispute. I have frequently had a curette enter a dilated tube when doing a curettement, and have never seen any unfavorable symptoms result from it. Of course care

was taken not to push it through into the abdominal cavity. None of these things should be attempted by inexperienced men.

Applications to the vagina kept up for a long time will be most satisfactory to the general practitioner. The patient can come to the office once every five days and receive an application of iodine and creosote to the vagina. This is followed by the packing with tampons. In the intervals she uses the hot-water douches and avoids over-exertion and is tolerably comfortable. When she knows that the alternative is a serious operation the average woman will prefer treatment even for many months.

Peri-salpingitis.—Inflammation of the Fallopian tubes and that of the peritoneum immediately around them are so intimately associated in their symptoms and treatment that no effort at their separate consideration will be attempted. The general description of pelvic peritonitis will exhaust those parts of the subject not included in the consideration of salpingitis. It is doubtful if a peri-salpingitis ever exists without a preceding salpingitis. This clinical picture is not materially different, and no effort at minute pathology is required. When the inflammation around the tube is extensive enough to cause symptoms of itself it becomes to all intents and purposes a pelvic peritonitis, the description of which will follow.

Pyo-salpinx.—Of pyo-salpinx little need be said. The tube is sealed at both ends, forming a cyst. When this cyst contains clear watery fluid it is called a hydro-salpinx, and when blood is within it it is a hæmato-salpinx. These conditions do not differ materially in the symptoms produced

from pyo-salpinx. They are not common, and will not require further attention.

Symptoms.—In pyo-salpinx, the tube being closed, there is no purulent discharge. There may be leucorrhœa due to causes existing in the other tube, in the uterus, at the cervix, or in the vagina. As a rule, only one tube is occluded. The symptoms do not differ from those of chronic salpingitis. The examination enables the distinction to be made. A rounded mass will usually be felt at one side of the uterus. It may be as large as a man's fist. If not too much obscured by the thickened peritoneum fluctuation can be made out. A crease can usually be made out between the uterus and the tumor. The mass feels not unlike the fundus might feel if enlarged and misplaced. The fundus can be found elsewhere in the pelvis, either with the examining touch or a sound. The conditions most liable to be confused with pyo-salpinx are other kinds of enlargements of the tube, ovarian cyst, and hæmatocele. The enlargements of the tube may be due to the presence of blood or other fluid in a sealed-up tube, or a tubal pregnancy. The latter condition can usually be distinguished by the presence of some of the rational symptoms of this condition. If there is doubt, a removal of some of the material from within the uterus may clear up the diagnosis. It is believed that decidua can always be found in the uterus when extra-uterine gestation exists. A microscopic examination of material from the endometrium may find this. Its presence is diagnostic, while its absence is not positive evidence that a pregnancy does not exist in the tube. Hæmato-salpinx will usually have a history of suppressed hemorrhage, or some symptoms by which it can be distinguished.

The Treatment of pyo-salpinx is essentially surgical. When the tumor is adherent to the vaginal roof and separated from the general peritoneal cavity it may be evacuated through the vagina. When not accessible through the vagina the only rational treatment is removal by laparotomy. The dangers of rupture are considerable, and delay should be advised against.

Pelvic Peritonitis and Pelvic Cellulitis.—These conditions can well be considered together, as they are so frequently associated, the latter rarely, if ever, being found except in conjunction with the former or as an immediate sequence of it. The question of the existence of a true pelvic cellulitis will not be discussed here. The fact that the specialists in the profession are divided into almost equal parts proves one thing in regard to the claims of each. It proves that the conditions are so closely allied in symptoms and pathology that they are rarely differentiated clinically. This being the case, they will be described under one head in this place. This seems all the more appropriate as the treatment is the same for each.

The Pelvic Peritoneum.—By pelvic peritonitis is meant an inflammation of that portion of the peritoneum in the pelvis. A brief mention of its anatomy will make this subject clearer. The peritoneum comes down along the interior of the abdomen and passes over the upper part of the bladder, covering that viscus from a point slightly down its anterior wall backward. Its folds dip behind the bladder, covering a large part of its posterior wall. This membrane then rises along the anterior of the uterus. This depression or pocket between the bladder and uterus is in intimate relation with the

anterior wall of the vagina, high up in front of the cervix uteri. The peritoneum passes upward along the anterior uterine wall, covering the fundus uteri, to which it is closely adherent, then, dipping behind this organ, it follows its contour along its posterior wall to a point near the level of the internal os. From this point the peritoneum again rises along the rectum and posterior walls of the pelvis, passing upward into the abdominal cavity. This depression between the uterus and the rectum is the cul-de-sac of Douglas, and can be felt by the examining finger behind the cervix in the highest point of the vagina.

The fold of peritoneum covering the fundus of the uterus extends on either side of that organ, remaining closely adherent to its lateral walls. It is here perforated by the Fallopian tube on each side. The fold of peritoneum passes over, forming the upper edge of the broad ligament, and then extends almost vertically down to the bottom of Douglas' pouch. The tubes and ovaries are behind this last-mentioned part and attached to it, the external end of this sheet of peritoneum being attached to the bony pelvis, its inner end being attached to the uterus. This broad ligament is thus a double fold with the uterine appendages behind it. It aids the other ligaments in supporting the uterus in its upright position in the pelvis.

The folds of peritoneum depressed between the bladder and uterus in front and those between the uterus and rectum behind form the two pockets where pelvic peritonitis is found. The inflammatory condition may extend upward over the fundus higher and involve the general peritoneal cavity in a general peritonitis; but it usually has its beginning in one of these pockets.

The cul-de-sac of Douglas is usually the point first involved in a pelvic inflammation. The fact that these inflammations are always the result of infection from without accounts for this result, because the infection is often carried in through the tubes, and these are suspended just above this cul-de-sac.

The Causes of pelvic peritonitis are many. It is frequently due to septic infection from the uterus. In the puerperal state, when that organ becomes infected the inflammation can reach the peritoneum in several ways. It may travel up along the Fallopian tubes and out of their fimbriated extremities, involving the peritoneum; it may travel along the lymphatics and reach the peritoneum; it may travel through the veins as a septic phlebitis and involve the peritoneum; and it may travel by juxtaposition of tissue through the uterine walls, involving those folds of peritoneum in immediate contact with the uterine fundus, and thence spread along the peritoneal substance, involving more or less of that membrane.

The puerperal state causing it may be from an abortion or from a delivery at term. More cases of pelvic peritonitis are met with following abortion and miscarriage than delivery at term. The general manner in which it comes about is by causing a metritis and subinvolution, and the peritoneal involvement is a direct sequence of the inflammation of the uterus.

The metritis may come from other than puerperal causes. The route of the infection is the same, though its results may differ, due to the infecting substance. The peritonitis may follow immediately after the infection, but more fre-

quently the metritis exists for a time before the peritoneum is involved.

The most frequent cause of pelvic peritonitis after the causes following pregnancy is gonorrhœal infection. A gonorrhœal vaginitis becomes a cervical metritis, a corporeal metritis, a salpingitis, and then, either by contiguity of tissue or from leakage from the outer ends of the tubes, a pelvic peritonitis. Any exciting cause may set up an acute salpingitis in tubes full of gonorrhœal pus and result in an inflammation of the pelvic peritoneum. Other causes of pelvic peritonitis are cold, especially at the time of or immediately before the menstrual flow, falls or other injuries, strain from lifting or overwork, injury from coitus or other cause, injuries to the cervix, as laceration, and drugs. The taking of drugs to bring on the menstrual flow is frequently resorted to by married women who wish to avoid pregnancy, and pelvic peritonitis is one of the most serious of the consequences that follow this dangerous custom. Many women are to-day suffering and enduring much inconvenience, requiring operations and treatment to restore them to even an approximation to a healthy condition, as a result of efforts in this and other ways to avoid pregnancy and its inconveniences. The mechanical means often used to induce abortion are responsible for many cases of peritonitis resulting from septic poisoning at the cervix, which is usually injured by such efforts, and many deaths are due to this cause alone. Another cause of pelvic peritonitis is operative procedures to the cervix and uterus. Cases are on record of fatal peritonitis resulting from passing a uterine sound. Inflammation may be lighted up by the manipulation necessary to repair a

uterine cervix, or it may follow curettement. In these cases a previous inflammation usually exists, leaving adhesions or chronic peritonitis, which is lighted up by the operation.

The Symptoms of pelvic peritonitis may be indefinite, but they are usually sufficient to cause an investigation of the condition of the pelvic organs. There is frequently a history of a cause. She will confess to getting up too soon after a confinement, or to a miscarriage where no physician was seen. There may be only a history of a menstruation delayed a week or two "over time," followed by a very profuse flow with much pain and clots of blood. This will indicate an abortion where the fetus was so small that its exit was not noted. There may be a history of a very profuse leucorrhœa of yellowish color and creamy consistency, accompanied by frequent micturition and dysuria, indicating an attack of gonorrhœa. The patient will usually be ignorant of the cause of this attack, and frequently she has no suspicion of its nature. Acute pelvic peritonitis may follow the exciting cause immediately, when the history is easy to trace. Frequently there is an interval of gradually getting worse, until some accident lights up the chronic condition and is looked upon as the cause of all the mischief, when its real cause occurred, it may be, years back.

In either case the symptoms of an acute attack are the same. There is the usual condition found with acute inflammations in the pelvis—fever, which may be as high as 104° F. or more. The pulse goes up with the fever, unless dangerous weakness sets in, when it will sink to the normal or below and be very feeble. Nausea and vomiting are frequent. There may be no other constitutional symptoms.

There usually is pelvic pain, aggravated by motion of the limbs or pelvis, and by defecation, burning in the vagina, with or without leucorrhœa, backache, and pains in one or both inguinal regions. This last symptom frequently indicates the side on which the inflammation is most pronounced, though both sides may be equally involved. Frequent micturition is also a frequent symptom, and pain when the bladder is full is common.

Digital Examination of the vagina removes all doubts as to the condition. The vagina will feel hot, showing the presence of local inflammation, and is usually extremely sensitive. The pelvic floor is hard and tender. The least touch against the cervix causes pain, and any effort to map out the positions of the organs will cause much suffering. It is well in these cases not to attempt to learn too much at the first examination, as the inflammation may be dangerously aggravated by rough examining. If the inflammation is due to puerperal causes the leucorrhœa is apt to be stained with blood and considerable odor is present; whereas if the cause is gonorrhœal the discharges are seldom stained with blood and there is no odor of the character caused by retained secundines.

The Treatment of acute pelvic peritonitis is much the same as that of a general peritonitis. Like the treatment of the latter condition, it has been radically modified within the past few years. The results obtained warrant the change. The treatment is of two kinds, internal and local. The internal treatment should be begun with a thorough saline purgative. The best drug for this purpose is Epsom salts. This should be given in the form of a saturated solution in

small doses frequently repeated. It is best to give from one to four teaspoonfuls every half-hour until a thorough purging is obtained. If there is vomiting and the sulphate of magnesium cannot be retained, opium or morphine sulphate by hypodermic injection must be used in sufficient quantity to control the vomiting. If enough morphine is required to get its narcotic effects, it should be followed by the magnesia in one large dose, an ounce or more, as soon as the stomach will retain it. The purgative action will then commence as soon as the morphine effect begins to pass off. When treated in this way the vomiting rarely recurs, and the purging is followed by a fall of temperature and a profuse perspiration and usually by sleep. She will awake from this sleep weak, but free from pain and fever, and convalescing.

If there be much pain a small hypodermic injection of morphine should precede the purgative. An eighth of a grain or less will usually make her quite comfortable and will not give any of the constipating effects of the opium. After the purge has acted, rest and perfect quiet are of the utmost importance. Little medicine is needed for the next few hours. If the fever goes up again the purge must be repeated, or calomel in a dose of from ten to twenty grains may be substituted, to be repeated in four or five hours if needed.

The manner in which the sulphate of magnesium acts has been hinted at elsewhere. The solution causes a discharge of the fluids from the intestinal glands into the gut. The intestine is thus filled with an alkaline solution. On its outer side is the seat of the inflammation. Between them are one or more layers of animal membrane. These are the condi-

tions most favorable to osmosis, and the result is a flow from the tissues to the interior of the intestinal canal. The depletion of the local tissues acts on the same principle as a local plebotomy. The main difference is that in bleeding all the constituents of the blood are removed, while the purging only removes the fluids, leaving most of the nourishing elements yet in the circulation. One or more such local depletings may be required to cause the acute stage of the inflammation to subside.

After the use of saline cathartics care must be taken to prevent the alimentary canal from being closed again. The free evacuation must be kept up. The rhubarb and ipecac mixture given on page 224 will usually be sufficient. A teaspoonful is given every two or three hours as may be needed.

If the magnesium sulphate solution causes much griping or there is much discomfort from gas in the bowels it may be relieved by sedatives.

℞

Spr. lavend. comp..... ℥ j

Aq. anise .....q. s. ad. ℥ iv

M. Sig. ʒ ij to ℥ j every three hours.

The above solution will soon quiet the bowels without interfering with the purgative. If the gas causes a general tympanitis over the colon and the patient is unable to expel it, a long rubber tube can be passed high into the colon through which the gas can find an exit. The patient will be much relieved by this device.

This treatment must be accompanied by the most perfect quiet and absolute rest in bed. All dejections from the

bowels or bladder must be received in a bed-pan. The patient should be moved as little as is possible. In putting the bed-pan under her she must not raise herself but must be lifted by the nurse.

The food given must be guarded with scrupulous care. Milk is not a safe food during the first few days. Its tendency to curdle makes it dangerous at times, as the bowels may be seriously clogged up by it. Toast and bread in any form are bad. The diet safest to use is composed of thin soups and broths containing no milk or starchy matter. The basis of these should be meat, and they should be strained so as to contain no solid particles.

If any tendency to continuous febrile action exists, five grains of the sulphate of quinine given three times a day will be of benefit. Aside from this, drugs are rarely indicated.

The *local* treatment of acute pelvic peritonitis is important. The vagina must be douched three or four times in every twenty-four hours. These douches should be given with the utmost gentleness and the force of the stream should be as little as possible. The temperature of the water should be from 105° to 110° F., and about a gallon should be used at each time. In some cases the douche cannot be used for the first few days, as the parts are too tender to bear any manipulation.

Abscess.—Acute pelvic peritonitis may result in abscess. The abscess may either go on to suppuration and be expelled in various directions, or it may end in resolution. The most favorable result is when it ruptures into the vagina. The bladder, the rectum, the intestine, or the general peritoneal cavity may all be invaded by the pus from a ruptured ab-

scess. When the abscess can be felt through the roof of the vagina and hæmatocele has been excluded the correct treatment is puncture and evacuation. This should be followed by thorough cleansing and tight packing. The packing should be frequently changed, the cavity being washed out when the packing is out. The abscess may result in resolution, but it is dangerous to trust to getting such a result. The golden rule of surgery should receive no exception when the pelvis is involved. Pus should always be removed when found.

Chronic Pelvic Peritonitis.—Acute pelvic peritonitis may terminate in recovery and complete resolution of the inflammatory process. More generally the result is in a chronic pelvic peritonitis. The course of chronic pelvic inflammation is indefinite. Usually there is a number of attacks of a more or less acute form. These attacks may be brought on by violence of any kind, by colds, by a fresh infection of germs from an abortion, or by other causes.

These attacks last for a variable length of time and then subside. They usually add something to the amount of exudated material in the pockets of the pelvic peritoneum. The "adhesions" are the most important sequel of the inflammation. They are bands of plastic lymph which become organized and bind the pelvic organs together. The quantity may be so great that all these organs are glued together in one solid mass, filling the entire pelvis. If there is uterine deviation the organ is fixed in that position. If the ovaries or tubes are prolapsed they are imbedded in the adhesions and held permanently in their abnormal position.

The Symptoms of chronic pelvic peritonitis are many of

them reflex. They depend upon the extent to which the pelvic peritoneum is involved. If there is only a small amount of inflammatory products in Douglas' cul-de-sac, they may be slight or none at all. If the involvement is extensive the suffering caused may keep the patient in bed.

Pains and heaviness in the pelvis with tenderness over the lower abdomen and dragging pains in the back are usually present. When found, these symptoms are all made worse by remaining too long standing, by walking, or by any movements involving the muscles of the abdominal walls or the muscles from the thighs that enter the pelvis. The latter muscles may be so interfered with as to cause lameness and even to prevent the use of the thighs. The passage of masses of feces through the rectum causes pain. Pain is also present when the bladder is full. Coition or examination of the vagina is painful, and douches may cause extreme suffering.

The reflex symptoms are of the class already described under the head of "uterine syndroma" in the chapter on metritis. The nausea is apt to be annoying, and vomiting is common. Indigestion, flatus, and constipation are generally present. Pains in the top of the head and at the back of the neck are usual and cause the patient much discomfort.

Examination is frequently made with difficulty because of the tenderness around the uterus. The least motion of the cervix causes complaint, and a bimanual examination is impossible in most cases. The peculiar boardlike impression the finger receives from the pelvic floor is characteristic. It is, in many cases, impossible to indent the vaginal roof. The

finger cannot be pushed up by the side of the cervix to any extent, and the position of the uterus cannot be made out.

These are the cases in which the use of a sound can do so much harm. The chronic inflammation can easily be lighted up into an acute form, and may even spread to the general peritoneal cavity.

Treatment of these cases of chronic pelvic peritonitis is tedious. They do not get well rapidly, yet the amount of good that can be accomplished by properly directed efforts is at times surprising. The greatest caution is not to attempt too much at once. All applications must be made carefully, and for a time at least must be made to the vagina only. The liquor Monsel is a most important remedy. The amount used must be regulated by the results obtained. If the mucous membrane will stand it the applications can be made every five days. If much irritation is caused they must be made further apart. If any erosion or laceration is present at the cervix a painting with the iodine and creosote mixture will be of benefit. It may be introduced into the cervix if this can be done without too much effort.

The applications to the vagina should be followed by a tampon. Here, again, caution must be observed at the first few treatments until the endurance of the condition is learned. The contraction caused by the iron solution is so great that a very small tampon may cause much pain. The contractions will be more if glycerine is used. Usually it is better not to use anything on the tampon during the first stages of the treatment. The tampon becomes saturated with the iron solution and secures to the mucous membrane a prolonged contact. The result from the medicine is thus increased.

After the tenderness has been removed and the dangers of acute exacerbation have passed, it may be advisable to pack the vagina full of tampons in order to secure the effects of pressure on the adhesions to aid in their attenuation. The methods for the further treatment of these adhesions is described in the chapter on uterine deviations.

Douches are an important factor in the treatment of chronic pelvic peritonitis. They must be hot, prolonged, and at low pressure, and not used in a way to produce pain. One or two gallons three times a day is usually the best quantity to use. A temperature of 110° F. can usually be well borne.

Rest in bed for a few weeks at first may be necessary, but in many cases only care in going about is required.

Internal medication is of benefit in many cases. The iodide of potassium is frequently used, and the bichloride of mercury can be given with it in the form of "mixed treatment."

℞

Hydrarg. chlorid. cor. ..... gr. ss
Potass. iodid. ..... ʒ ij
Syr. sarsaparil. comp. ..... ℥ j
Aqua. ..... q. s. ad ℥ iv

M. Sig. ʒ j after each meal in water or milk.

The above gives five grains of the iodide and one sixtieth of a grain of the bichloride to each teaspoonful. If more is needed a dose of two teaspoonfuls can be used.

Bromides and remedies for the alimentary canal can be used as indicated. The chief element is not to do too much manipulating in the pelvis, and to take plenty of time. Six months or a year may be needed to effect a cure.

CHAPTER XIII.

DISEASES OF THE OVARIES.

The various diseased conditions of the ovaries are so intimately associated with other forms of disease in the pelvis, external to the uterus, that it is a matter of considerable difficulty to make the differential diagnosis, and at times it is even impossible to do so; nevertheless a distinct ovarian pathology exists, and its appreciation should be attempted. The conditions that are difficult to distinguish from ovarian involvement are diseases of the Fallopian tubes, neoplasms in and around the broad ligaments, and pelvic peritonitis, either with or without abscess or pelvic hæmatocele. The most confusing of these are salpingitis and peri-salpingitis, and as the treatment for both of these does not differ materially from that of ovarian inflammation it has been taught that their distinction is not material to the practitioner. This does not seem to be sufficient grounds for describing diseases of the ovaries and tubes together, hence a chapter is devoted to each.

Congestion of the Ovaries.—There is a group of symptoms, varying somewhat according to different observers, but by all attributed to the ovaries, that cannot be called an ovaritis of either acute or chronic form. It has been called hyperæmia by some, congestion, irritability, or neuralgia by

others, yet none of these terms completely conveys what the condition is. The limits of this disease become narrower as knowledge of the true pathology of the ovaries increases, and will no doubt be even more reduced by further observation.

Causes.—The symptoms of this condition indicate that it is caused by undue excitement of the functional activities of the ovaries. Young girls who live in unhealthy moral surroundings exciting their passions, which are ungratified by sexual connection, suffer from it. It is also frequent in engaged women, due to caresses, and in many cases they are entirely unconscious of the cause of their suffering. The natural function of sexuality is stimulated and congestion ensues. The reading of sensational novels is another fruitful cause of this condition. It is also found in young widows at times. Sedentary habits, excessive applications to study, and constipation are also causes of this condition. "Intermenstrual pain" belongs to this class of ovarian diseases.

The condition supposed to exist is indicated by the names given to the disease. There is believed to be too much blood in and around the ovary, producing a congestion and resulting irritation, and at times pain. This congestion is relieved by the menstrual flow, and accounts for the frequent absence of symptoms at or immediately following menstruation, especially if the flow is profuse. It is also relieved by any other depleting condition, and marriage frequently cures it. Pregnancy causes a suspension of the ovarian function and cures the malady by rest.

In married women excessive coitus is occasionally a cause of ovarian congestion. When due to this cause, sterility due to the same excess is apt to exist.

The Symptoms of ovarian congestion are indefinite, but chiefly of the character called "nervous." The patients are fretful, irritable, and easily excited. There may be irritability of the bladder with frequent micturition. If not relieved by abundant menstruation she may become anæmic and acquire nervous debility, hysteria, or other diseased conditions of the nervous system. If the surroundings are favorable she may resort to onanism.

Examination of the pelvis may reveal absolutely no evidence except the irritability in which the whole organism participates, but usually there is tenderness in the region of one or both ovaries. If they can be made out at all the ovaries are in most cases somewhat enlarged. Tenderness over the ovary in the inguinal region is a common symptom.

It is common to find an anteflexion of the uterus with these cases, usually of congenital origin and accompanied by stenosis. In these cases it may well be that the uterine trouble acted, at least in part, as an etiological factor to the ovarian disease.

The Treatment of congestion of the ovaries must begin with a removal of the causes. The engaged young woman had best get married, the novel reading must be suspended, the overwork at study or sedentary occupation must give way to rest, the crowded city had best be left for freer customs and better air in the country. Pure air, healthful exercises, and proper moral atmosphere must be secured. Sea baths, cold bathing, with friction and massage, may be of assistance, but are not so important. The nervous irritability must be controlled by bromides, in the form of the bromide of sodium, either with other remedies or alone, and

must be given in sufficient amount to control the symptoms; from fifteen to twenty grains three or four times each day or oftener may be required. Its use must be continued a long time, though a single dose each night may be sufficient. The stomach must be protected from the bromide salts by plenty of water administered with it.

Tonics must be taken at the same time, nux vomica being the best. This can be taken alone, or with iron if anæmia be present. Ergot will relieve the congestion and lessen the irritability by diminishing the amount of blood in the pelvis. The constipation so frequently present must be relieved and its recurrence prevented. Cascara in some form will often be efficient for this purpose, or the following made into a pill or capsule may act better:

℞

Extr. nuc. vomic.	gr. iv
Extr. belladonna	gr. iij
Extr. colcynth. comp.	ʒ j
Aloin	gr. v

M. Ft. pil. No. xxx. Sig. From one to three pills before retiring.

In cases of women who have been married, frequent irrigation of the vagina with a gallon or more of hot water at a temperature about 110° F. will often relieve the congestion and allay the symptoms. When due to excess in married women, separation of a few months from the husband will frequently effect a cure without other treatment, pregnancy often following the return to her home and bed.

Ovaritis.—Inflammation of the ovaries is either acute or chronic.

Acute Ovaritis may be either of gonorrhœal or puerperal origin. When the infection is gonorrhœal both ovaries are liable to be involved, while inflammation due to puerperal infection is frequently confined to one ovary. Other causes of infection are rare, but some authorities claim to have seen them, the germs entering the organism in a manner similar to the entrance of the poisons of the eruptive fevers.

The united opinion of all modern observers is that ovaritis can only exist with the invasion of the ovary by infecting germs, the manner of their conveyance being usually by continuity of tissue through the uterus and Fallopian tubes, although occasionally they may gain an entrance through the lymphatics, the veins, or directly through the substance of the uterine walls and adjacent tissues. When the disease is carried by any channel but the natural one the pelvic peritoneum is, as a rule, first involved, the inflammation of the ovaries being a complication of the peri-metritis and peri-salpingitis.

Acute ovaritis frequently occurs as an exacerbation of a chronic inflammation, and a number of these recurrent attacks may be seen in the same patient, very slight provocation being required to start them. Acute ovaritis is usually complicated by salpingitis or peri-salpingitis, or both, the inflammation in the tube being at times confined to the fimbriated extremity. It is impossible to tell if there was first an ovaritis, a salpingitis, or a pelvic peritonitis in these cases.

The termination of acute ovaritis is in abscess, which may involve the whole organ, forming one large abscess cavity, which may rupture into the abdominal cavity, the vagina, the rectum, or the bladder; or it may result in resolution

without abscess or other injury to the ovary, or it may become a chronic ovaritis.

The Symptoms of acute ovaritis are those of acute pelvic inflammation from any cause. The pain and tenderness are usually more circumscribed than in pelvic peritonitis, and the so-called nervous symptoms are more apt to predominate. There is always more or less of febrile movement, which is preceded by a chill or chilly feelings. The local temperature is usually considerably higher than that of the general body. Nausea and vomiting are more frequently present when the ovaries are involved than with other pelvic inflammations.

Treatment.—There are two phases in the consideration of treatment for acute oöphoritis: the first is the preventive, and the other is for the diseased condition itself.

Prompt attention to gonorrhœa, with a view to restricting the disease to the vagina, or curative treatment measures for the metritis, will usually prevent the invasion of the ovaries by the gonococci; and like thorough removal of all post-puerperal infection from the uterus, as soon as found, will prevent the further progress of the germs of this condition. Of course it is better yet to avoid puerperal infection at all by proper precautions at delivery; but the cases of this character frequently reach the gynecologist after this unfortunate event has occurred, and prompt and correct action on his part is called for to prevent the spread of the infection through the entire genital tract and the invasion of the general system causing a pyæmia.

Treatment directly for the acute disease in the ovaries is not completely satisfactory. The most important thing is

perfect rest in bed. The diet should be of a character easily assimilated but nourishing, and the pain, if severe, must be controlled by morphine. If the stomach is upset the morphine can be given hypodermatically; it should be given in eighth of a grain doses and not too frequently repeated, so as to avoid its constipating effects. A small dose of atropine sulphate acts well with the morphine and also has a tendency to allay the congestion. The morphine also keeps the stomach in condition to retain the saline cathartics which recent observations have shown to be so important a factor in the treatment of acute inflammation in the pelvis, especially when tendency to suppuration accompanies the inflammatory condition. The production of catharsis is the most important part of the treatment of acute pelvic inflammation, and is best accomplished with a saturated solution of the sulphate of magnesia. The solution is given in doses of two teaspoonfuls every fifteen to thirty minutes until a number of copious watery movements from the bowels result. This will produce a depletion of the system of its fluids, and acting by osmosis relieves the congestion, the temperature falls immediately, and any tendency to return must be promptly met by a fresh purging. Quinine should be given in the intervals between the use of the salines. Calomel will act well in cases where for any reason the salts cannot be taken, but a single dose of the sulphate of morphine will usually be sufficient to relieve all tendency to be nauseated by the latter, and nothing acts so promptly in removing congestion and arresting threatened suppuration.

The use of other remedies indicated is not to be prevented by this treatment, especially the local treatment in the form

of hot douches and hot turpentine stupes to the abdomen. Poultices are rarely indicated.

Chronic Ovaritis.—The inception of chronic ovarian inflammation may be slow; existing as a chronic inflammation from the beginning, it may be due to infection occurring in a case of congestion, but this is more liable to cause acute ovaritis. The chronic form of inflammation may also result from an acute form.

The inflammatory process may continue indefinitely, or may result in hypertrophy due to the formation of fibrous tissue, which by its contraction and lessening of the blood-supply may eventually cause atrophy and suspension of function. These conditions of hypertrophy followed by atrophy are sequelæ of chronic oöphoritis of long standing.

There is generally inflammation in and around the Fallopian tubes with the chronic ovaritis, probably preceding it in time of its inception and due to a metritis which may still remain active.

Symptoms.—Chronic inflammation of the ovaries is not associated with febrile disturbance of the general system. The symptoms are distinguished by their tendency to assume a "nervous" type, but of a milder form than in acute ovaritis. Mental depression in the form of low spirits and attacks of "blues" is a characteristic of this condition; pains in one or both inguinal regions are present, and are frequently reflected around to the lumbar region or down the leg. Reflex headaches, gastric symptoms, and hysteria are occasionally present. The pains in the inguinal regions are frequently worse for a day or two before the menstrual flow begins or during the first day of the flow. In other cases

the women are more comfortable at the time of menstruation than at any other time. The other symptoms of pelvic inflammation are generally present to a more or less degree, many of them no doubt being due to the inflammation existing in the pelvic peritoneum, the tubes, or the uterus itself.

Examination will reveal a more circumscribed spot of tenderness in one or both lateral fornices than in pelvic peritonitis. If the ovary can be made out it can be distinguished from a tube by the rounder outline and absence of the tube-like sensation communicated to the finger by that organ. If displaced into the sac of Douglas immediately behind the uterus, the ovary can frequently be made out and its size clearly defined. The peculiar nausea produced by pressure upon it will help to distinguish the ovary from the tube or any other tumor. Rectal examination will frequently give more definite information. If a tumor is found which cannot clearly be decided about, examination for the ovary elsewhere in the pelvis will often give a clue; for while inability to find an ovary does not prove conclusively its absence, yet its discovery higher up is evidence that the suspected tumor is not an ovary, cases of a third ovary being too rare to deserve consideration.

Other tumors that might be mistaken for an enlarged ovary are fibroma in the broad ligament, cystic tumors in the pelvis, pelvic abscess, tubal pregnancy, and fecal masses in the rectum. The continuous growth of the fibroma with the associated tendency to hemorrhage will usually establish its diagnosis. The fluctuation which can usually be made out in cystoma or an abscess will make them evident, while the variable size of the oöphoritis will distinguish it from

either tubal gestation or fibroma of the tube or broad ligament, both of which grow progressively larger, while the ovarian tumor often makes considerable changes in size in a few days, these changes being closely connected in point of time with menstruation and ovulation.

Hypertrophy of the ovary can usually be felt on bimanual examination or by rectal touch, and atrophy is distinguished by the discovery of the small ovary and the cessation of its functional activity before the patient has reached the age when the normal menopause is to be expected.

The Treatment of chronic ovaritis is either surgical or palliative; a perfect cure is not the rule. The general health must be improved by tonics, exercise in the open air, if she can take it without pain, and attention to the condition of the alimentary canal. If much pain exists the patient should maintain a recumbent position and receive massage for the exercise of which she is deprived. Counter-irritants to the vaginal vault or over the abdomen may prove beneficial and should be tried. Tincture of iodine, the actual cautery, or blisters can be used for this purpose.

A most important factor in the treatment of chronic disease of the ovaries and tubes is attention to the condition of the uterus, disease within this organ being in many cases the focus of infection, a breeding-place for germs, from which continuous reinfection of the appendages occurs. The endometrium may need a thorough curettement after dilating the cervix, and should be thoroughly mopped off with absorbent cotton dipped in very hot water. After rendering the uterus thoroughly aseptic, an applicator wrapped in cotton should be dipped in a solution of equal parts of glycerine and car-

bolic acid and applied to the entire surface of the endometrium. This treatment must be followed by intra-uterine applications of the tincture of iodine and creosote, and the usual treatment for metritis as has already been described.

Electricity may be of benefit in some cases, and can be tried.

Bromide of sodium must be given for the nervous symptoms; and other sedatives, as anise-seed water, spirits of lavender, etc., may relieve the reflex symptoms, especially the tendency to flatus.

Oftentimes small doses of bichloride of mercury followed by the iodide of potassium or sodium will cause improvement. This alternative treatment is generally more applicable to stout than poorly nourished women. The latter do better on the iodide of iron given with such tonics as nux vomica and quinine.

In cases where the woman is suffering to such extent that her life is useless an operation for removal of the diseased organ is justifiable. In case only one ovary is involved the other may be left, but it frequently gives trouble afterward, a second laparotomy being called for to remove it. If there is the least evidence of disease on inspection, both should be removed while the abdomen is open.

Tumors of the Ovaries.—The ovaries may contain neoplasms, which may be either benign or malignant. The benign tumors are cystic, fibro-cystic, or fibrous. The malignant growths are either sarcomatous or carcinomatous.

Ovarian Cysts may be multiple or single, but the single form is usually a compound cyst composed of a number of small cysts in one envelope. The multiple cysts are also

each compound, but each group is in a different part of the ovary.

These cysts may contain papillæ extending inward from the cyst-wall, or they may contain hair, bone, teeth, fat, etc. They are the most common form of ovarian tumor.

Fibroma of the ovary is rare, and fibro-cystoma is even more rare. They all increase gradually in size and do not grow by involving adjacent organs.

Any of these benign tumors may form adhesions attaching the ovary to the various neighboring parts. If the attachment is to the intestines obstruction may result and fatal results follow.

A pedicel may exist between the ovary and tumor, and after the adhesion has formed to some other part this pedicel may atrophy from dragging upon it or from twisting and the tumor may thus lose its attachment to the ovary and become attached to some other organ. This process is called transplanting. The cysts may rupture, in which case the event is sudden, and the contents escape into the general peritoneal cavity. Perforation may result from a gradual process, and is usually preceded by the formation of adhesions, consequently no sudden escape of the cyst contents occurs. When the perforation is in the direction of a hollow viscus, like the intestine, the contents of the cyst may be evacuated in that way.

Inflammation may be set up around the cyst and may go on to suppuration and rupture. If it rupture it may be either into the general peritoneal cavity or through adjacent tissues into the vagina, bladder, or externally through the skin.

The Symptoms of ovarian tumor are frequently obscure. In fact, none may be present at all; but there is usually pain localized in the ovarian region, with general pelvic discomfort, tenesmus, dragging, and tenderness. The character of the pain is neuralgic or "ovarian," and may be more at the menstrual period or just before or after that time.

The menses may be normal if only one ovary is involved, the well one causing a normal flow; but usually there is suppression of this function.

The tumor as it increases in size may displace the other pelvic organs. The uterus may be pushed aside or the bladder or rectum be encroached upon. When it has attained sufficient size the enlarged ovary rises out of the pelvis, producing enlargement of the side of the abdomen. It may then press upon the abdominal viscera and produce symptoms resulting from the pressure. Deranged digestion, constipation, and loss of appetite result. Loss of flesh is apt to be a consequence, and chills followed by fever may exist. Dragging pains and dyspnœna are frequent with these large tumors. Death may ensue from the wasting and pressure of a very large ovarian tumor.

Examination of the pelvis will find a tumor to the side of the uterus, or if the ovary is prolapsed it may be found in Douglas' pouch directly behind the uterus. This tumor is usually soft and yielding, smooth and globular. If multiple cysts are present irregular projections may be felt on its surface.

The examining finger will find difficulty in distinguishing this condition from pyo-, hydro-, or hæmato-salpinx, fibroma in the pelvis, pelvic hæmatocele, or pelvic abscess. The sub-

sequent history will aid in the differential diagnosis. Fecal masses have been mistaken for ovarian tumors, but not in the hands of careful men.

The Treatment is removal by abdominal section, and where this is impossible because of excessive adhesions, the result is necessarily fatal.

Malignant Ovarian Tumor is not to be distinguished in its earlier stages from the benign form, except where the ovary is prolapsed so as to make it accessible to the examining finger. The organ is rough to the touch and nodular; it is also hard, and the enlargement is more rapid than in the benign form.

The Treatment is removal, if discovered before adjacent organs are involved to such extent as to make a radical removal impossible.

CHAPTER XIV.

FIBROMA.

Uterine Fibroma.—The name fibroma is applied to all fibrous growths in the pelvis and elsewhere. Pelvic fibroma may be in the mucous membrane of the vagina, within the cervix, or inside of the uterus itself. These mucous or submucous growths are frequently spoken of as polyps. They may have an attachment at or near the fundus and hang down into the uterus, and may extend through the cervix into the vagina, in which case they may be difficult to diagnosticate from inversion of the uterus. The uterus shown in Figure 93 has polypoid fibroma attached at the fundus by a narrow pedicel. In Figure 94 the tumor is larger and the pedicel broader. Fibroma in the wall of the uterus or its cervix are called intramural. They may so uniformly involve the uterine walls as to cause a uniform enlargement of that organ with no evi-

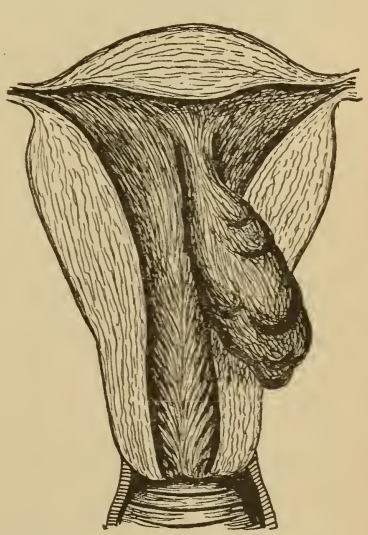

Fig. 93. Mucous Fibroid. (Martin.)

dence of a tumor at any point, or they may occur in one or more places, making nodular thickenings. Cancer of the uterine body is also apt to take this nodular form and confuse the diagnosis. Fibrous growths also occur on the outer part of the uterine body or adherent to the tubes, ovaries, the parovarium, or in the broad ligaments.

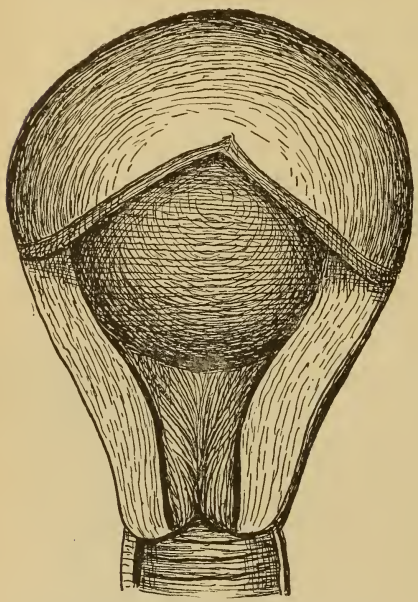

Fig. 94. Mucous Fibroid with Broad Base. (Martin.)

The Symptoms of fibroma may present a clear-cut picture, or they may be so obscure as to mislead the most careful diagnostician. There is usually some derangement with the menstrual functions; this may rarely take the form, at least for a time, of amenorrhœa, but the usual history is of an excess of the flow to a greater or less extent. Cases of well-marked uterine fibroid will also be met with giving positively no history of any abnormality in the menstrual flow. The first symptom noticed is usually an increased flow. Instead of three or four days, the flow will remain five, six, or even ten days. The intervals between the menses may change and a metrorrhagia be added to the menorrhagia. Menstru-

ation will occur every three weeks, every two weeks, or the flow may come one day and miss a day or two only to recur in a short time. Daily hemorrhage is more significant of disease of the cervix or of cancer than of fibroma.

Between the hemorrhages there may be pain, leucorrhœa, dyspareunia, dysuria, and backache, and there is frequently dysmenorrhœa and passage of clots with the flow. Symptoms due to pressure on the rectum, as piles, and constipation may exist.

Examination of the pelvis reveals a tumor, which may be in the cervix, where its presence is evident, or it may be within the uterus, when only the increased size of that organ can be felt, or if large enough and adherent by a pedicle within the cavity, it may come down through the cervix and be felt within the internal os. It may be intra-mural, when the examining finger can detect, in addition to the enlarged uterus, a hardening of the uterine wall. The tumor may be nodular or flat. If a single rounded enlargement exist, it may be mistaken for a misplaced fundus in retroflexion, anteflexion, or lateroflexion. The sound will clear up the true direction of the uterine canal and reveal the presence of the tumor in these obscure cases. A very small uterine fibroid is usually sufficient to cause much hypertrophy of the uterine wall. This is caused by the increased vascularity in that organ due to the fibroma. The main difficulty in diagnosis is to eliminate other causes of uterine enlargement. Pregnancy is occasionally accompanied by menstruation for some months, but a pregnant uterus is soft to the examining finger, while a uterus containing a fibroid is hard. The characteristic softness of the pregnant uterus around the in-

ner os, as described by Sonntag (Hegar's sign), will prevent any error in these cases if the examiner is on his guard. Cancer of the uterus is more rapid in its growth than fibroid, though the scirrhus form may be equally hard, and the character of the hemorrhage is different. The diagnosis may be in doubt until ulceration begins, when the characteristic odor of cancer will make its diagnosis clear. The removal of tissue from the intra-uterine cavity and its microscopic examination should be done where doubt exists. Hemorrhagic endometritis might confuse, but the uterus, though enlarged, is not hard, as in fibroma, and the body of the uterus is of uniform consistency. Abortion with retained placenta, etc., can be distinguished by the history, by the material rejected, and the odor of the discharge, and by what the curette brings away. Inflammation of the tubes may cause a mistake in diagnosis when so closely adherent to the uterus as to seem part of it either at its sides or in Douglas' pouch, for here there may also be repeated hemorrhages. But these tumors seldom increase in size, and may get smaller at times, while a fibroma usually grows uniformly larger. Fluctuation can frequently be detected in the tube and not in the fibroid. It is well to remember here that a fibroid may *seem* smaller when the general congestion of the pelvis has been lessened by a copious menstruation, but this fact should not mislead the physician. A fibroma within the uterus will often be found by the sound. It is well also to remember that all fibroids of the uterus increase the length of the uterine canal. The tumor may stop the sound before the fundus is reached and prevent its passage further.

The Non-surgical Treatment of fibrous tumors of the uterus

is chiefly palliative. The general treatment aims at getting the patient in the best possible condition of general health and environment, and keeping her there. The local treatment has much the same point in view. Copious hot vaginal douches should be used twice daily, and applications of Monsel's solution should be made to the entire vaginal vault once a week, and followed by very tight tamponnading, if the latter is well borne. The tampons should be packed in all parts of the vagina and should be thoroughly saturated with glycerine. Applications to the endometrium are also required and should be thoroughly made. The best method is by introducing an applicator well wrapped with cotton and saturated with the medicine used. The best remedies for intra-uterine applications are tincture of iodine, tincture of iodine and creosote, equal parts of each, or carbolic acid and glycerine, equal parts. In using any of the above preparations care must be taken to see that the cervical canal is patulous, or serious results may follow from the absorption of the sloughs caused and resulting sepsis. The internal use of ergot, hydrastis, etc., has been highly extolled by some. Dr. J. W. Houston of Oxford, Pa., uses the following and claims good results:

℞

Ext. ergot. fl.
Ext. hydrast. fl.
Ext. hamamel. fl.....āā ʒ j

M. Sig. ʒ j three times daily in water.

I certainly have seen cases benefited by the above. It is necessary to continue its use for a number of months to see its best effects. Medicinal treatment of uterine fibroid only

does good indirectly, according to Pozzi, ergot by contracting the uterus and preventing hemorrhages, and arsenic and phosphorus by relieving the mal-nutrition. The hydrastis is also very efficient in controlling hemorrhage from the uterus. The following is the plan of Hildebrandt:

℞

Ergotine.....	gr. lxxv
Chloral hydrat.....	gr. xv
Aqua. destill.	ad ʒ iij

M.

Twelve minims of the above are daily injected deep in the buttock or deltoid muscle, and its use must be persisted in for months. Authorities differ as to the effects of ergot on these tumors.

Abdominal Fibroids.—Fibroma may exist in the abdominal cavity entirely distinct from the uterus. These growths do not enlarge the uterine cavity and there is no metrorrhagia. They may be mistaken for ovarian cysts, or *vice versâ*. Fluctuation, if found, proves the tumor of cystic origin. The cyst develops much more rapidly than the fibroma. The gravid uterus has been mistaken for a fibroid in the abdominal cavity, and the mistake not discovered until the abdomen was opened for its removal. In these cases Hegar's sign of pregnancy was present in so marked a degree as to cause the examining finger to be unable to detect any connection between the cervical portion of the uterus and the fundus, the former being mistaken for the whole organ and the latter for a tumor. Fibroma of the broad ligaments can be distinguished from parovarian cysts by the fluctuation in the latter. They may be difficult to

distinguish from pyo- and hæmato-salpinx, but the history and general symptoms usually remove all doubt.

The Course of fibromata is usually quiet but progressive, though it is occasionally rapid and fatal. The menopause usually terminates it by atrophy and diminution in size. The induction of a premature menopause by castration is because of this fact. When the climacteric is near, unless the symptoms threaten life none but palliative measures should be used, leaving the cure to that condition. Cases of spontaneous expulsion of auterine fibroid have been observed, when the tumor was submucous or intra-mural. The chief danger from fibroma is from pressure on the bladder or the ureters, causing nephritis, on the rectum, and from hemorrhage. Pregnancy may cause absorption, but this is not without danger. I saw one case in which the sloughing fibroid in the uterine wall caused septic absorption after delivery, and death from septicæmia on the fifth day.

Treatment of Pelvic Fibromata by Electricity is based on the principles first formulated by Apostoli. It is consequently called Apostoli's method. He made the abdominal pad large, so as to avoid the pain received from strong currents applied to a limited surface of skin. These pads are usually made of clay inclosed in layers of cheese-cloth.

The other pole is connected with a metal electrode, which is made to lie in contact with the uterine mucous membrane. The action of the different poles on the mucous membrane is different, the positive pole being that of a caustic acid, while the negative pole is that of a caustic alkali. Further than this, the positive pole possesses a marked hemostatic effect, while the negative pole can be used to destroy small granula-

tions, vegetations, etc. When hemorrhagic conditions are to be treated the hemostatic action of the positive pole is utilized, while the negative electrode is used in cases of sloughing from granular surfaces or where redundant tissues are to be destroyed.

The electrode for intra-uterine applications is made of platinum and shaped like an ordinary uterine sound. This is covered with celluloid tubing except at the tip, and can be attached to a cord connecting it with either pole of the battery. Modern batteries are usually made with an attachment by which the poles can be reversed simply by turning a small lever. This enables the operator to reverse the current without changing the position of the electrodes.

As the metritis with fibroma is usually hemorrhagic the positive pole is most frequently used, but at times, when it is desired to reduce the tumor, the negative pole is used during a part of the treatment and followed by the positive pole, or one treatment is devoted entirely to the reducing efforts of the negative pole, to be followed by the hemostatic effects of the positive pole at the next treatment.

Apostoli insisted that the amount of electricity given should always be carefully measured by an amperemeter, and that it should be given in definitely known quantities.

Fibroma treated by the electric current are frequently relieved. It can hardly be called a cure that leaves the tumor in the pelvis, yet in the most favorable cases not only is active growth checked and all the symptoms caused to disappear, but a marked reduction in the size of the tumor is produced. This favorable condition may continue until the onset of the menopause makes it permanent, but again the active condi-

tion may start up at any time. This recurrence is equally true of any other form of treatment except complete removal and possibly the production of a premature climacteric by castration. These cases of renewed activity are usually much more difficult to control by any but radical measures than the first condition was.

Some of the most prominent surgeons also contend that when operation for removal becomes necessary the prognosis is not so favorable in cases where electricity has been used. Dr. Joseph Price of Philadelphia gives expression to the most pronounced opinions against the use of electricity for fibroma of any man in America.

When the fibrous tumor is in the pelvis but not in the uterus or adherent to it, the effort is made to cause the electric current to pass through it. This is done by placing the metal electrode as near to the tumor as possible. At times it can be approached better from the vagina, and again the interior of the uterus is the nearest point.

Some critics of this method maintain that no current that is not dangerously strong can penetrate the tissues deep enough to have any effect on these deep-seated fibroma. Others endeavor to overcome this objection by having the electrode made sharp at the point and thrusting it directly into the tumor. In fibroma within the peritoneum this method is attended with danger and is rarely justifiable. Cutter, who advocates this method, had four deaths in fifty cases, a rather alarming record, and one not calculated to encourage its use.

Figure 95 is taken from Martin's case of multiple uterine fibroma This patient suffered from hemorrhage to such a

degree as to produce a condition of "anæmia and extreme weakness." She had several treatments by curettement and had a thorough course of ergot without relief, and was then treated by electricity for four months without the slightest effect upon the flooding, and finally hysterectomy was done, revealing the cause of the failure of the other treatment. The many submucous tumors so distorted the uterine canal as to make it impossible either to curette or cauterize its entire interior. The intramural tumors aided in distorting its shape.

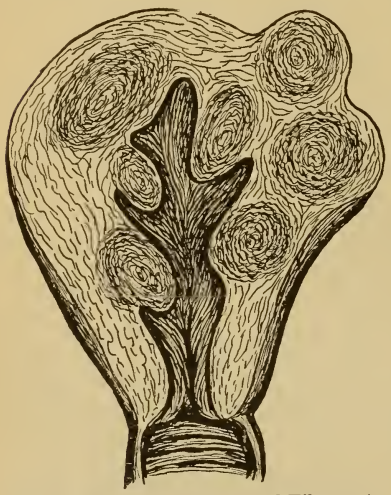

Fig. 95. Multiple Intra-mural Fibromata. (Martin.)

According to some authorities, electricity in the treatment of fibroma rarely produces a diminution in size, and the apparent reduction is due to the removal or lessening of perimetric exudations as a result of rest and the good care which always is an accompaniment of its use. Whatever effect is produced in reducing the size of the tumor and stopping its growth ceases when the administrations cease. The good effects from electricity are to lessen hemorrhage and pain and improve the general condition. It may be tried especially in those cases where operations cannot promise a radical cure. Where excessive hemorrhage is present the positive pole must be used in the vagina and to the endo-

metrium. Where this fails a thorough curetting will often control the bleeding. Apostoli claims that the electrode acts as an "electric curettage," and thus removes the cause of the hemorrhages. With this idea in view the actual removal by an instrument under perfect control will be preferred by all surgeons, the work done by a curette properly and thoroughly used being certainly more scientific than the indefinite results of the caustic action of the electrode in the uterine cavity with the uncertain action of the current and the certainty of not reaching the whole of the intra-uterine mucous membrane. A thorough curettement is usually sufficient to relieve the hemorrhagic tendency, and often cures it after the electricity fails. The detritus loosened by the curette is removed; that caused by the current must slough away unless removed by the curette afterward, but if the curette is to be used at all it seems superfluous to use the electricity.

The electro-chemical or "interpolar" action directly on the tumor is not proved, and its effects are often slight, if any. The chief benefit from electricity is due to the contraction in the uterine walls it causes, and this can usually be brought about better by a thorough curettement.

Small fibroids in the uterine walls or in the cervix can often be enucleated and removed. A sharp curette (Fig. 96)

Fig. 96. Sims' Sharp Curette.

will aid materially in removing them, or they may be removed by a long-handled forceps; the latter can best be used when the tumor is submucous or polypoid, especially when it oc-

curs at the cervix. Frequently intra-mural fibroids can be removed with a blunt curette.

Dr. Paul Outerbridge of New York has tied the uterine arteries for fibroid of the uterus where enucleation is not possible. This is a simple operation as done by him. The patient is given an anæsthetic and placed in the dorsal position with the thighs well flexed. The vagina is held well open with retractors on either side, giving a clear and easily accessible field for operation. The cervix is steadied by Skene's tenaculum, and the uterus drawn down if it is movable. The finger easily detects the pulsation of the uterine artery at the side of the cervix. A small incision with scissors is made over this point down as near to the artery as possible without wounding it. A curved needle is then passed around the artery, including the tissues, and threaded with a strong silk cord and withdrawn, leaving the double cord in its track, thus leaving a second ligature in case one should slip or break in tying. The cord is then tied and drawn with sufficient tightness to stop completely all pulsation in the artery. The artery on the opposite side is tied in like manner and the patient put to bed. The ligatures are to be left in, and after a week's rest the usual intra-uterine and vaginal treatment is resumed. The uterus gets the larger part of its blood-supply by the uterine arteries, and tying them off lessens the tendency to hemorrhage, and, its inventor claims, causes atrophy of the fibroma. It certainly is a much simpler operation than castration and less dangerous, and causes no mutilation, leaving the woman functionally intact. The cases in which I have tried this operation were benefited by it.

The radical operation for removal of the fibroid is only indicated when other means have failed, and not then unless the patient's life is endangered either by incontrollable hemorrhages or by pressure from the size of the tumor.

When radical removal is impossible by reason of adhesions or for any cause, removal of the uterine appendages, thus inducing a premature menopause, may cause an arrest of the fibrous growth. In careful hands this operation is not a particularly dangerous one, yet it should not be hastily urged, and cases are met with in which it fails to give relief.

CHAPTER XV.

CARCINOMA.

Carcinoma.—A special chapter devoted to carcinoma may seem unnecessary in a treatise on gynecology, and especially so in a book devoted to therapeutic gynecology, yet it is required to make this work complete.

Location.—The pelvic organs may all become the seat of cancerous disease. The most common situation, probably from its liability to injury, is the cervix uteri. Cancer may also occur in the body of the uterus, in the vagina, in the vulva, in the ovaries or the parovarian tissue, and in the tubes or broad ligaments.

The Course of cancer in the pelvis is progressive, and requires little consideration except that called for by the modifications in its progress due to its environment. Its constant tendency here as elsewhere is to invade adjacent tissues and eventually to break down in sloughs, causing destruction of the parts invaded, until death puts an end to its fatal progress. This may occur in several ways. Hemorrhage may result from destruction of a blood-vessel before it has been occluded by infiltration of the diseased tissue or by clot. The amount of bleeding depends on the size of the artery or vein broken into. It may be fatal in a very few hours, or several hemorrhages may occur each depleting the patient and mak-

ing her weaker, until she dies of simple inanition; or a small hemorrhage or two may occur early and be entirely recovered from, leaving the patient to be destroyed in some other way. Absorption of septic material from the sloughing surface may cause general septicæmia and death.

The case may linger on for many months, growing gradually weaker and weaker from the effects of the disease and its discharges, and from the almost constant pain, until she is left entirely devoid of strength and almost devoid of anything but skin, bone, and sloughing sores, dying at last worn out with the hopeless struggle, death being welcomed as a long-delayed relief.

Complications resulting from the cancerous disease may prove fatal, the most common being nephritis; or metastatic growths of a malignant character may form in other organs, causing a fatal termination.

Symptoms.—The important thing for consideration in cancer is an early diagnosis. The most distinctive symptom of cancerous growth is pain. This is usually present early in the disease, and is of a sharp, piercing character.

Cancerous growths in the vulva and vagina are easily accessible, and an early diagnosis is thus rendered easy. This is equally true when the disease is in the cervix or even in the body of the uterus. At any of these points a portion can be removed and the diagnosis established by microscopic examination. The importance of using this means of removing all doubts as to the true nature of the disease cannot be overestimated. The only hope of radical cure depends upon the diagnosis being established at the earliest possible moment. The microscope is a certain test in proving the pres-

ence of carcinoma. Failure to find the germs can only establish its absence after examination of a number of specimens taken from various parts of the suspected tissues.

When the disease is in the parametrium or in or around the appendages its presence can only be suspected at the first examination. The differences between fibroma and malignant tumors of these parts are not always clearly defined. As has been said, there is usually more pain with cancer than with fibrous growth, and the latter is less likely to be nodular. The hemorrhage from cancerous disease is different from that with fibroma, there being more tendency to a regular daily discharge of bloody leucorrhœa. This difference is not so marked until sloughing has begun on the cancerous surface. The metritis complicating the early stages of one is not to be distinguished from that with the other. The progress of cancer is more rapid than fibroma and the involvement of adjacent tissues more extensive. The fibrous tumor grows in size, but not by involving other organs as does cancer. In the later stages of cancer the peculiar odor of the discharges is not to be mistaken. The diagnosis can be made by it alone before the patient has been seen. The peculiar hue of the skin of patients in whom cancer has ceased to be a local disease is also characteristic.

Cancer of the External Genitalia, if seen early, can be radically removed. The accompanying picture (Fig. 97) is taken from a photograph of an unpublished case of Dr. John Woodman of New York. The condition is shown before the removal of the entire left labia majora and its corresponding nympha. Three enlarged glands were also removed from the inguinal region. I assisted at the operation, and the

carcinomatous character of the growth was established by microscopic examination. There was no recurrence of the

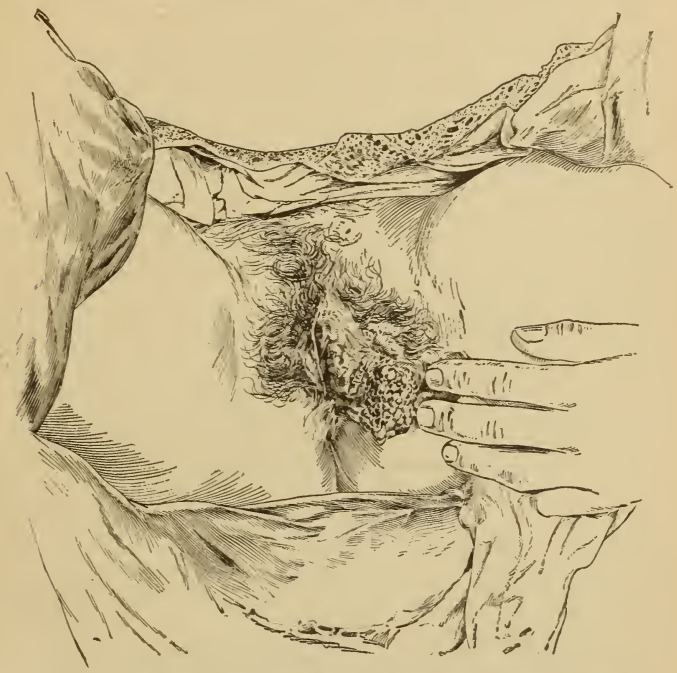

Fig. 97. Cancer of the Vulva, taken from Dr. Woodman's Case.

growth at the expiration of two years, when she was lost sight of.

Cancer of the Cervix has some peculiar characteristics that will at least lead to a more thorough investigation. The cervix is usually the seat of laceration which has been neglected for a number of years. There is hypertrophy, which is frequently at the lowest point, giving a "cauliflower" shape to the cervix. The consistency is not so dense as that of simple hypertrophy, and the hard resistance given by fibrous

growth is absent. Instead of these there is a spongy impression given to the examining finger, as if the parts were saturated with fluid and ready to break down at any time. At the highest limit of this softer tissue a zone of quite hard tissue is frequently felt. The cancerous growth in the cervix may be limited to a small spot or it may involve its whole circumference. When the body of the uterus is invaded by the disease it is hard and unyielding to the finger at the side, and nodules or irregularities are frequent. These must not be mistaken for multiple fibroids of the uterine wall, which are smoother over each individual tumor, while the malignant tumors are irregular in form and broken by depressions and elevations. When the entire uterus is involved in a cancerous growth it may be smooth and uniform in size.

The Treatment of carcinoma depends upon the stage when it comes under observation. The importance of an early diagnosis is great. When there is no systemic involvement indicated by cachexia, and the local involvement is such as to permit it, a radical removal with the knife will permanently cure the disease. This removal must include every particle of tissue that has been invaded by the disease. Veins that have become occluded by coagula must be followed and dissected out, as well as all lymphatic vessels and glands that are in any way involved. Recurrence is only evidence that some diseased point has escaped the knife.

Some physicians who do not use the knife to a sufficient degree to feel perfectly at ease with it express a preference for the electro-cautery for the removal of cancer. This is not a satisfactory method, as it does not give the necessary opportunity to examine the margin and be assured that all

the diseased tissue has been removed or destroyed, and it cannot be so perfectly controlled.

Caustic pastes have been used for the destruction of malignant growths, but these have usually been the resort of quacks, and are unscientific and in no sense reliable. They are usually made from the chloride of zinc or some similar caustic.

When the diagnosis of carcinoma of the cervix has been established and the disease is limited to that portion of the uterus, its removal is the only justifiable treatment. This can be done even when the diseased area extends almost to the fundus. A high amputation of the cervix can usually remove all the involved tissue. When the fundus has been invaded by the malignant growth the question of operation is yet *sub judice.* Some surgeons advise removal of the whole organ, either by vaginal or abdominal hysterectomy, while others oppose any operation in these cases. When the vagina has been extensively involved in the diseased process, and especially when the walls of the bladder or rectum have been invaded, few surgeons will advise operation. My experience with amputations of the cervix is not favorable, while hysterectomy by the combined method is usually successful, and recurrence is rare.

Palliative Treatment.—When the general systemic symptoms show plainly that the disease has become general, operation can only be palliative. Such palliative operations are justifiable. If a sufferer with incurable disease can be given a few months of comparative comfort and her life prolonged for a short space of time, she should be given the opportunity to have an operation done. A clear statement

of her condition and the object to be attained by the operation should be laid before her and her family before it is done, and the decision should rest largely with them.

Removal of flat surfaces with the sharp curette is often classed among the palliative measures for cancer. Yet cases are seen in which the whole of the involved tissue can be removed in this way. The curette is frequently used in vaginal cancer, where excision with knife or scissors would be liable to invade the adjacent rectum or the bladder or urethra. The entire vaginal wall can be removed with a sharp curette, and the progress of the disease at least retarded materially if it is not entirely cured. Cancer of the endometrium, either cervical or corporeal, when limited to the mucous layer can be removed in the same way. The sharp spoon or curette will often check for a time the progress of the cancer located at the cervix when there is much ulceration and yet too much infection of surrounding tissue for removal by hysterectomy.

The Use of Drugs for the treatment of cancer properly occupies a secondary place in the consideration of this disease. Yet they have a legitimate place, and their consideration is of special importance to the gynecologist. The remedies employed have many enthusiastic advocates, some of whom advise their use to the exclusion of other measures, even in cases where the nature of the disease is clearly demonstrated early enough for complete removal by the knife. They claim to cure by local applications and internal remedies. Where the disease is limited and the diagnosis even reasonably certain, it seems like wasting valuable time to trust to medicinal efforts at cure. Few surgeons will be willing to

take this risk. Consequently the virtues of these remedies are extolled almost exclusively by physicians who do not operate.

Their use does produce good results at times, and while I know of no records of cured cases in which the diagnosis was established beyond doubt by the microscope, yet many "suspicious" cases have recovered under this plan of treatment.

These applications form the only treatment left in cases where operation is contra-indicated from any cause. In this class of cases are those who cannot take an anæsthetic because of heart disease or advanced kidney involvement, also those who decline operation, and cases where the stage of the disease or the parts involved make operation unwise. Local applications are also used to prevent recurrence after operation, and where the operation has been only palliative to delay the progress of the disease as much as possible. They are also useful to promote healing of surfaces that have been denuded by the curette and to limit the progress of destruction where sloughing is present.

Tincture of iodine has long been used as an application for cancer. Strong solutions of nitrate of silver have also been tried. A solution containing equal parts of beechwood creosote and tincture of iodine is a more recent remedy. Cases of cervical slough which had been declared to be cancerous by several gynecologists from the microscopic appearance have been healed by continuous treatment with this solution. Several such histories have been under my notice and verified; but in none of them has the diagnosis been verified by the microscope. None of these cases have yet been published.

The tincture of iodine and creosote is applied on a cotton applicator every third or fourth day, and no tampon is used after it. The parts should be well saturated with the solution and the most scrupulous cleanliness maintained between the treatments. This remedy certainly acts in a decided manner in checking the progress of cancer with ulcerating surface in the genital canal. The sloughs become less offensive and the sloughing is decreased in a remarkable degree. The pain and general systemic symptoms are diminished, and the opportunities for septic infection are reduced to a minimum. There can be no doubt that the period of life and usefulness is materially lengthened by the use of this remedy.

When the slough is in the vagina it is well to take a small piece of absorbent cotton in the dressing forceps and saturate it thoroughly with the solution. This is then placed in contact with the surface of the sore, and gentle pressure causes it to cover the diseased surface. If the slough is within the uterus, the cervix should be dilated so the applicator can enter the cavity and a considerable quantity of the solution be left there. It is well for the patient to be treated at her home, and to remain in the recumbent position for some minutes after the application is made. If the slough is external she may make the application herself about every second day, if it is not convenient to have the physician call so often.

Methyl blue has been used more recently, and it is claimed that it will heal the ulceration of malignant growths even more rapidly than the creosote. It is applied in the same manner. Pepsin in powder or solution will cleanse a cancer-

ous ulcer by digesting the necrotic tissue and thus destroying the offensive odor so characteristic of these sores. It should be daily used to promote the comfort of the patient and her attendants. It is doubtful if it has any effect upon the cancer itself except that of producing cleanliness.

This cleanliness is a most important element in the treatment of cancer of the genito-urinary apparatus. Copious warm-water douches must be taken, and frequent bathing of exposed parts is necessary. A twenty-per-cent solution of carbolic acid is very efficient as a cleansing douche. It should be used daily.

Salol in powder or solution may be used to keep the surfaces clean, and with carbolic acid may be added to the hot-water douches to destroy the odor, or pepsin can be used in the same manner for this purpose.

The Internal Treatment for cancer is largely symptomatic. The so-called specifics mentioned from time to time have all failed to stand the test of scientific investigation. Arsenic has probably been used in this way longer than any other remedy, yet no case of cure from its use in which the diagnosis was made beyond a possibility of a doubt is on record. Arsenic is an excellent tonic and agrees remarkably well with some people. Cases of seeming improvement from its use are probably due to this fact.

The cancerous bacillus has been sought for for a number of years. Several investigators claim to have discovered it, but a reasonable doubt of its discovery still exists in the minds of medical men, many of whom even doubt its existence.

The treatment of cancer by *electricity* has been described

by Dr. J. Ingles Parsons. His method is to pierce the tumor and the tissues for some inches around it with fine needles, so as not to injure the skin or mucous membrane. A strong galvanic battery is used, and the strength of the current is carefully measured. As much as six hundred milliamperes are used in some cases. The applications are made under an anæsthetic, the pulse and respiration being carefully watched as the strength of the current is increased.

Dr. Parsons thus summarizes the effects produced by the action of electricity. It causes "a cessation of growth, gradual disappearance of pain, some shrinking and hardening of the tumor, and enlarged glands, followed by improved nutrition and a better state of the general health. The growth as a whole does not disappear but remains as an inert mass composed in all probability of fibrous tissues alone."

The advantages claimed for the electricity in treatment of cancer are that no destruction of tissues nor loss of blood accompanies its use; that it may be repeated at any time or any number of times; that the patients are not laid up by its use for more than a day or two; and finally, that the current can be made to pass through parts of the body inaccessible to treatment with the knife. To give the electricity for cancer of the uterus, the affected part is transfixed with a number of fine needles attached to the negative pole of the battery. The positive pole is attached to a pad of clay or absorbent cotton, which is applied over the abdomen. A current of from one hundred to two hundred and fifty milliamperes can be borne by some patients without an anæsthetic.

Some authorities claim good results with currents of from twenty to fifty milliamperes. But the best results are claimed for the more powerful currents.

At times needles are indicated at both poles in order to bring the electrodes nearer together. The needles at the positive pole must be made of platinum, or some other substance that will not be attacked by the action of the electricity.

Electricity is one of the palliative remedies for cancer, to be used when for any reason radical removal is not feasible, but its use is not to be recommended in cases that can be cured by the knife.

Crystals of the chloride of zinc will destroy a hard cancerous nodule by actual burning. This is especially applicable to nodules in scar tissue where the disease shows a tendency to recur after operation. No scar results from its use, but a healthy slough forms under it. Cocaine can be applied before using the crystal, as the burn is quite painful.

CHAPTER XVI.

PELVIC HÆMATOCELE.

Pelvic Hæmatocele.—Dr. T. More Madden defines pelvic hæmatocele as "a circumscribed collection of blood effusion wholly or partially situated within the pelvic cavity, either in its peritoneal or in its cellular structures. This makes an intra-peritoneal form, which is usually the result of an extra-uterine pregnancy, and an extra-peritoneal form, which may be due to the same cause, but is more frequently due to menstrual abnormities."

Intra-peritoneal Hæmatocele.—Mr. Lawson Tait says he has "never seen an intra-peritoneal hæmatocele that was not due to a ruptured tubal pregnancy." The weight of recent opinion is that the tube is the general if not the only seat of these extra-uterine pregnancies, causing hemorrhage into the peritoneum. Cases arising from ovarian, abdominal, or interstitial extra-uterine pregnancy are rare, and all but the last so rare as to be curiosities. They are enumerated by some authors, but no cases cited that have been put to the test of operation or post-mortem examinations. The interstitial form is tubal, but in that part of the tube embraced by the uterine tissue. It calls for no special mention at this time.

The rupture of the gestation cyst to form hæmatocele is

always during the early stage, before or during the second month, and usually before the condition is diagnosticated. Rupture at a later period causes shock, hemorrhage, and death, unless very prompt surgical interference is had.

Rupture of a Graafian vesicle producing hemorrhage from the ovary or its peritoneal covering, and hemorrhage from any of these parts due to malignant disease, are given as causes of intra-peritoneal hæmatocele. These are very seldom met with, and the first is by some considered as improbable at least.

The Symptoms are usually those of rupture of the tube. There is more or less shock, depending on the size of the pregnancy, accompanied by severe pains low down in the abdomen, and usually confined to one inguinal region. There is generally a chill, and weak thready pulse, and the usual symptoms of hemorrhage; these symptoms gradually lessen, and the patient becomes comfortable but weak. She may remain so for a considerable period, but usually when she begins to move about there is a return of the bleeding, causing a recurrence of the symptoms.

Local Examination will reveal tenderness, which may be limited to one point, but is more generally diffused over the whole abdomen. The abdomen is swelled and usually tympanitic.

On examination per vaginam a tumor is found which may be at either side of the uterus, but is usually behind that organ, causing bulging into the posterior cul-de-sac of the vaginal vault. This tumor is soft, fluctuating, and diffused, so that its outlines cannot be clearly made out. It may have a "doughy" feel if partial coagulation of the blood has begun.

The Treatment of this condition is the outgrowth of modern gynecological research. The application of the principles of general surgery demands the immediate removal of the cyst by abdominal section, followed by a thorough irrigation of the peritoneal cavity.

Extra-peritoneal Hæmatocele is more frequently met with. This condition is very often due to a tubal pregnancy rupturing between the peritoneal folds of the broad ligament. A tubal pregnancy may so rupture as to cause the extravasation of blood to be in the cellular tissue adjoining the uterus (Madden).

Another cause of this form of hæmatocele is sudden suppression of a normal menstruation by an obstruction, or from cervical stenosis. The blood may first be dammed up in the uterus and escape thence into the tube and surrounding tissue, or it may be from an effusion of blood from the vessels, first into the tube and thence into the connective tissue.

The immediate exciting causes of extra-peritoneal hæmatocele are sudden suppression of the menses, violent exercise, intense mental emotion, over-fatigue, excessive or rude coition or coitus during the menstrual flow, injuries to the abdomen, exertion too soon after miscarriage, and violent straining.

The Symptoms follow one of the above-mentioned causes, the most prominent being hypogastric pain with fever, following some menstrual derangement, to which may be added irritability of the bladder.

Examination reveals a tumor behind the uterus or in the iliac region. At first this is soft and fluctuating, but it

becomes gradually firmer. The symptoms often develop gradually. The tumor may be so large as to appear above the brim of the pelvis or in the iliac region, or it may press on the vagina or rectum. It may displace the cervix in any direction. This tumor has fluctuation at first, and later on has a "doughy" feel, and it may be softer in some spots than in others.

Treatment of Extra-peritoneal Hæmatocele depends on its cause. When due to ruptured extra-uterine pregnancy, the least done the better, as the tendency is to spontaneous cure. If tapped, the cyst will fill again and kill the patient from concealed hemorrhage. Where the causes of the hæmatocele are menstrual other treatment may be needed to promote its absorption. The iodide of potassium and bichloride of mercury with quinine in some form acts well in many cases. Local applications to the vaginal vault assist materially. The best remedy for this is liquor ferri persulphate (Monsel) in full strength copiously applied, and followed by a tight packing with boro-glycerine tampons. This treatment should be repeated twice each week, the vagina being thoroughly douched between the treatments. These douches should be hot (110° to 115° F.) if all tendency to bleeding has passed.

When the hæmatocele undergoes suppuration and becomes a pus cavity it should be evacuated. This can usually be safer and more thoroughly done through the abdominal cavity than by vaginal puncture. At times the resulting abscess is low in the pelvis, and fluctuation can clearly be made out, usually either behind the cervix or in front of it. In such cases, when convinced that the plastic exudation has made a complete barrier between the abscess and the

peritoneal cavity, its evacuation through the vagina is the proper treatment. After the pus has escaped the opening should be dilated, the cavity thoroughly cleansed and packed firmly with aseptic gauze. This dressing must be changed frequently, and no douching allowed. If it is impossible to make an opening large enough to pack the abscess with gauze, a large drainage tube should be worn and the cavity irrigated with boiled water. Care must be taken not to use much force in injecting this water, as it may break down the barrier and escape into the peritoneal cavity. The drainage should also be so complete as to leave no possibility of any fluid being allowed to remain in the cavity. Where the opening is large enough to make the whole cavity accessible it is preferable to cleanse it with swabs of absorbent cotton saturated with hot water. These should be used over the whole inner surface of the abscess, and then it should be dried with more aseptic cotton before reapplying the gauze.

This treatment of abscesses in the pelvis resulting from hæmatocele is equally the treatment for pelvic abscess from any other cause. It is the rational surgical treatment of abscess wherever found, and should always be promptly employed when the diagnosis is made.

CHAPTER XVII.

STERILITY.

The gynecologist is frequently asked to treat women whose sole cause for complaint is that they do not get pregnant. In many of these cases it is the husband who is dissatisfied, and the wife applies for relief because she desires to gratify his desire for children. The husband frequently complains that the sterility is because the wife "does not love him as she ought."

Much domestic unhappiness is often the result of the inability to have children, and the physician who remedies the condition will win credit for himself and give happiness to his patients. The causes are oftentimes of a trivial nature and easy to remedy. It is advisable never to give up a case as incurable until a cause of a permanent nature is found. Much diligent investigation is at times required to discover where the fault is. The most searching inquiry into all the details of the conduct of the patient before, during, and after the act of copulation is sometimes necessary before it can be found. When found, the cause is frequently so small a circumstance as to be easily overlooked.

Causes.—The causes of sterility may be divided into three classes: those due to the male, those due to the female, and those due to the pair.

Causes Due to the Male do not call for extensive consideration here, but they should be eliminated when no cause is apparent in the woman before subjecting her to uncalled-for treatment. The most frequent causes are syphilis, gleet, impotence from excess, and the consequences of the abuse of alcohol. It is advisable in most cases to have an interview with the husband, to examine him thoroughly, and to subject his semen to a microscopical examination. Some of the above-mentioned causes can be overcome, and the man must be told of his condition and that the sterility is a result of it. Treatment on the proper lines will naturally follow with a result depending on its curability. Many women have been subjected to treatment and fault-finding because of a sterility in which they were in no sense a factor. It is the duty of such a woman's physician to find the cause and locate the fault where it belongs. It may not be advisable in all cases to tell the woman the cause of the trouble.

The husband may have tubercular disease of the testicles or any involvement impairing his sexual organs. These organs may be congenitally imperfect, or the imperfection may have been acquired from injury or disease. The treatment of causes due to the male is not given here. It is necessary, however, for the gynecologist to appreciate their importance and cause an investigation for them to be made in all cases where the least uncertainty exists. He may save his patient much unjust censure by bringing to the knowledge of the husband the fact that he himself is the cause of his being childless, and not the wife.

The Causes Due to the Female are of special importance to the gynecologist. Many of them have been mentioned in

the foregoing pages. When due to the absence of the ovaries or atrophy of these organs and consequent loss of function the case is incurable. The sterility of stout women who have progressively increasing plethora, scanty menstruation, and loss of sexual desire is also usually not benefited by treatment. When the sterility is due to stenosis of the cervix with congenital anteflexion the treatment of these conditions will frequently cure it. When due to long, narrow, infantile cervix, amputation of a part of this organ will effect a cure. When anteflexion of the uterine neck is present, removing the cervix and external os from a position of easy contact with the semen, reposition is usually sufficient. Sterility from metritis is common, and persists until the uterine inflammation is cured. When associated with salpingitis or pyo-salpinx the outlook is unfavorable, as these conditions are seldom cured without destroying the function of these organs. Sterility may be a consequence of diabetes or other disease of the general system, when its cure depends upon the results of treatment of this condition. Occasionally sterility is due to a hyper-acidity of the vaginal discharges. I have cured several cases by recommending alkaline douches before retiring. Sterility may also be due to excessive coitus. This is frequently the cause existing in newly married couples.

Treatment.—The treatment of sterility due to the woman has already been indicated in a great measure in speaking of the causes. When the mucous membrane lining the cervical canal is so thickened by congestion as to completely fill its caliber, passing a large sound has frequently been followed by the entrance of spermatozoa from the next act of coition,

and resulting pregnancy. If this does not secure sufficient patulency of the canal an Outerbridge drain can be introduced and worn. This is the purpose for which these drains were first used (Fig. 98). If the sterility is due to a faulty position of the cervix in an anterior direction, the external os may be bathed in semen by having the woman turn on her face immediately after its discharge into the vagina. The use of alkaline injections in cases of extreme acidity in the vagina has already been mentioned. The bicarbonate of sodium and borax are probably the best remedies to use for this purpose. The douches should be small and taken just before retiring. When due to excess it is advisable for the wife to leave her home for a few weeks unaccompanied by her husband. Conception will frequently follow shortly after her return. In many cases the sterility is due to seemingly trivial causes, and much care is required on the part of the physician or they may be overlooked.

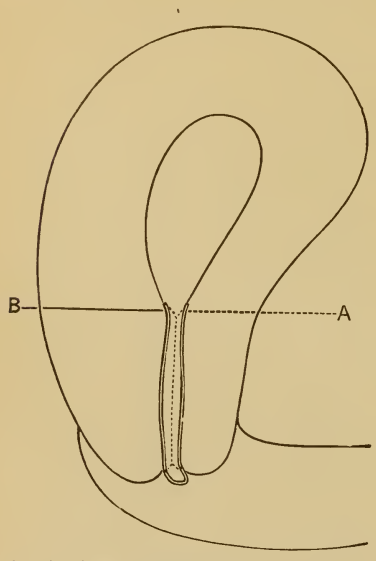

Fig. 98. Outerbridge Drain Worn to Cure Sterility.

Causes Due to the Pair.—Cases of sterility are frequently met in which the condition is not due to any cause existing in either the man or woman individually. Either with an-

other mate would probably have children, but for some reason they do not have with each other. The causes of this condition are obscure, nothing being positively known except the fact that such cases do exist. Many theories have been suggested to account for it. Consanguinity has been given as a frequent cause. The chief importance of this condition is its appreciation. Its treatment has no significance.

APPENDIX.

INSTRUMENTS AND OFFICE APPLIANCES.

THE physician who treats women in his office must have a few instruments and appliances there. A number of these have been mentioned in the preceding pages, and their use explained in describing the treatment in which they are used. Others have been mentioned, but no description of them given. A few pages devoted to the subject of instruments, appliances, and medicaments will not be amiss, and are here given.

The Office for the treatment of gynecological cases must be light and roomy. The light from northern windows is better than the direct rays of the sun. The upper sashes of the windows had best be used, for a number of reasons. It gives the light from a better direction for using in the majority of cases, and it makes it possible to cover the lower sashes with curtains. These sash curtains protect the room from the inquisitive outsider, and they give the patient confidence.

The Screen.—It is advisable to have a screen to surround the table. The patient will feel better if she cannot see the table while she gives her history and tells her symptoms. It is also better when some one is with her that the table be behind a screen so arranged that every movement of the

physician is not under surveillance. The screen is also convenient for her to retire behind to arrange her clothing before and after her treatment. It should be about as high as an average woman's head, and there should be three or four folds to it, so it can be bent around the table in the shape needed. It may be decorated, and thus be an ornament as well as a useful article.

The Table was described on page 20 and its essential features mentioned. The number of tables and chairs in the market is so great that a simple enumeration of them all would require more space than I have at my disposal. My first gynecological table was of my own construction, and it was used with perfect satisfaction for about six years. It cost less than ten dollars, the chief expense being the amount paid a blacksmith, who made the foot-rests. I show in Figure 99 a table that I have used, and find it fills all the requirements of a table. It is not shown because it is thought to be the best table in the market, but because it is simple of construction and answers every need. I have no doubt that other equally good ones are made. As a rule, the cheapest and least complicated tables are the best. Strength, simplicity, and convenience are the chief essentials.

Fig. 99. Daggett's Table.

The Cabinet.—Much has been said about applications in giving the treatment of the diseased conditions to the

description of which the preceding pages have been devoted. It is necessary to have some place to keep these substances at hand for use when indicated. If this receptacle will also hold the instruments needed for routine

Fig. 100. Instrument Cabinet.

treatment in the office an added convenience is obtained. The cabinet (Fig. 100) is intended to serve both these purposes. The four revolving shelves will hold the instruments for ordinary use, the movable shelf is at hand for larger instruments, and the drawers are large enough for

cotton, tampons, and supply bottles. The jars for immediate use will be most within reach if placed on top of the cabinet. This top is more desirable if it is covered with a thick plate of glass. The glass top will not stain or be injured in any way by the chemicals that may be spilled upon it, and it can be kept perfectly aseptic with little care. The cabinet is not made with these glass tops, but one can be obtained from the dealer, who will also send a man to put it on.

The Jars for drugs should also be glass with glass covers. The best are of uniform size from the bottom up, the mouth being the full size of the jar. The lid should fit over and rest on a depression cut around the outside of the top. For ordinary drugs four-ounce jars are large enough. Two eight-ounce jars will be convenient for glycerine and the boro-glycerine solution. Some drugs will require different receptacles because of their chemical properties. The nitrate-of-silver solutions must be kept in amber jars, those holding an ounce being large enough. If vaseline is used it can be kept in a similar glass jar, but some of the refined antiseptic oils are cleaner and pleasanter for both patient and physician. If it is deemed advisable to keep some vaseline at hand, the white vaseline is put up in tubes such as paints are kept in. A number of these tubes can be kept on one of the shelves with the smaller instruments.

The Solutions.—Having secured the jars, it is next in order to fill them. No attempt will be made to give all the remedies that have been advised, but the solutions I have at hand will be given. Each physician will discover his favorites and use them, and in many cases do much good

with them. No one should limit his work or armamentarium to the list of any one man.

The first large jar contains pure glycerine, the second the boro-glycerine solution. This I prepare according to the following formula:

℞
Glycerine.
Borax pulv.
Alum pulv..... āā ʒ iij
M.

Considerable stirring is needed to make a solution, but it can usually be secured. If all the powders do not dissolve, a little more glycerine may be added. If the alum is objected to it can be omitted, and the glycerine and borax mixed in equal parts. But usually the pure glycerine will answer where the alum is not required.

One of the smaller jars will contain the iodine and creosote mixture.

℞
Tinc. iodine.
Creosote (beechwood)..... āā ʒ j
M.

Another will contain:

℞
Acidi carbolici.
Glycerin..... āā ʒ j
M.

A third will contain about an ounce of the liquor ferri persulphatis (Monsel). This jar must not be filled too full,

and will require frequent emptying and replenishing. The fluid will evaporate if it is not kept tightly stoppered, and an insoluble powder is left which is useless. Much waste is avoided by putting only a small quantity in the jar at a time. A jar containing pure tincture of iodine is convenient. This will also evaporate rapidly and leave a concentrated solution, which may cause surprise by the intensity with which it burns when applied. Churchill's tincture of iodine is much used. The most popular formula is:

℞
Iodi ..... ʒ v
Potassi iodidi ..... ʒ j
Aqua ..... ℥ j
Vin. rectif. ..... ℥ iij
M. Sig. Churchill's tincture.

It is perhaps better to keep these iodine solutions in dark-colored glass-stoppered bottles than to put them in the jars for use. They all evaporate, and some of them change chemically from exposure to light.

A bottle of pure carbolic acid should also be at hand, but must not be left exposed. A solution of tannin in glycerine is much used. A china jar of powdered tannin is better perhaps.

The solutions of nitrate of silver must be in amber vessels. The stronger should be:

℞
Argent. nitrat. ..... ʒ j
Aqua. destill. ..... ℥ j
M.

The other silver solution is:

℞

Argent. nitrat..... gr. xv

Aq. destillat..... ℥ j

M.

A Suitable Lubricant for the examining fingers and for the specula and sounds should be at hand on a convenient table. Many substances are used. Vaseline is more used than anything else. It will not become rancid, no matter how long it is kept. Its chief objection is its action on the hands of the physician, having a tendency to make them rough and to chafe. For dispensary work a solution of castile soap is convenient. The dirt and soap can be removed at one washing. The chief objection to the soap is the smarting it occasionally produces in sensitive women. Cold cream or olive oil with a little carbolic acid rubbed through it will keep well, and is convenient in private practice. Some of the volatile oils, like glymol, will remain sweet without any antiseptic. I use voschano oil in private practice, both for the hands and speculum. It does not chap the hands or make them harsh, and causes no irritation to the patient.

A bottle of tincture of green soap should be in the office. It is convenient in many ways, and cleansing. A few drops added to a small basin of water is convenient to drop soiled instruments in or to bathe the hands.

The Basins.—Two small round agate-covered basins are always at hand. They are one third filled with water, the one containing about ten drops of the tincture of green soap, the other ten drops of carbolic acid. The water in each is warm and is changed, and the basin thoroughly

washed after each treatment. It is more convenient to have enough basins to change after each patient.

A slop-jar to receive waste pieces of cotton should be at the physician's right.

A low stool for the patient to step on in mounting the table is useful, and a low chair for the physician completes the furniture. Of course plenty of clean towels are at hand, and a fresh one is used for each patient.

Where the light is poor, or patients are treated at night, a reflector may be needed. This can either be arranged on a bracket attached to the wall, or by a mirror for the head.

The usually used Instruments are specula (Sims', Mundé's, and bivalves), dressing forceps, sounds and probes, vaginal retractors, intra-uterine applicators, tenacula, and a pair of universal scissors. It is also convenient to have several flexible pessaries, a Wylie dilator, a box of Outerbridge's drains made of fourteen-carat gold, and a jar of tampons made ready for use.

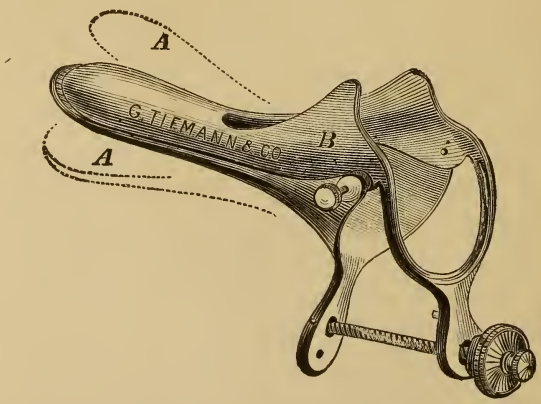

Fig. 101. Brewer's Speculum.

Brewer's speculum (Fig. 101) is a bivalve instrument that is much used. It is an easy instrument to introduce, especially where the vagina is small. It is small at the points of the blades, and enters the vagina without causing much inconvenience to the patient. It has been made of aluminium with slight increase in the price, and becomes one of the lightest instruments both for the patient and for the physician to carry in his satchel.

Graves' speculum (Fig. 102) is also a bivalve, but is much larger in the blade than the Brewer. It can be converted into a Sims speculum by reversing the blades. The extra

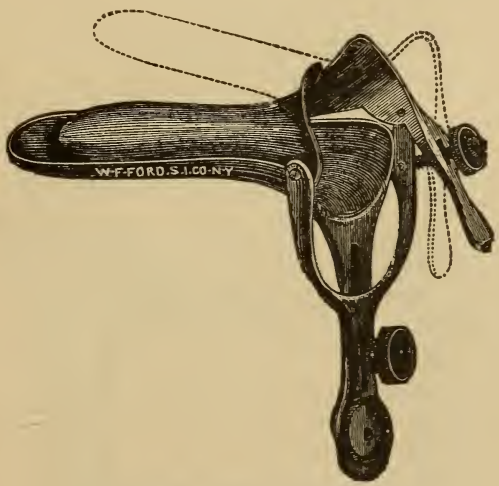

Fig. 102. Graves' Speculum.

breadth of blade makes this a better instrument for large flabby vaginæ, to secure a greater degree of separation of the vaginal walls. This instrument is much heavier than the one last described, and is also more complicated and

more difficult to keep clean. It is also made of aluminium, when its weight ceases to be an objection.

Sims' speculum has been described on page 39. For convenience various modifications have been made. Dawson's

Fig. 103. Dawson's Modification of Sims' Speculum.

modified Sims' speculum has a hinge at the angle where the blades are fastened to the shaft. This makes it occupy less room in a satchel when folded (Fig. 103).

Mundé has modified Sims' speculum by adding a wide flange to one side to hold up the buttock. This instrument

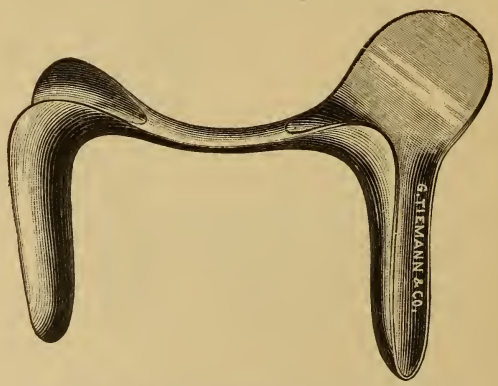

Fig. 104. Mundé's Modified Sims' Speculum.

is convenient when a Sims speculum is used without an assistant (Fig. 104). The self-retaining instrument of Cleve-

land is provided with a similar flange and is a more convenient instrument.

The most complete dressing forceps is shown in Figure 105. The blades are so jointed together that their points separate with a spring action, being held together by a sliding catch, which is moved back and forth by the thumb held

Fig. 105. Dressing Forceps.

against the round projection on its upper side. The blades of this instrument should be very narrow and thin at their points and perfectly smooth on their faces. They are occasionally made with corrugations on their inner side, but should not be; the grip of the blades should be sufficient to hold bits of cotton or a sponge without any roughening of the blades, and for the introduction of tampons the corrugations are a disadvantage because they make it more difficult to remove the instrument from the cotton after it has been introduced. When bunches of cotton are used to cleanse the vagina it is difficult to throw them loose from the forceps when the blades are roughened. It is very inconvenient to use both hands to remove these when making applications, as a tenaculum or other instrument may require the other hand. Bozeman's dressing forceps (Fig. 33) are also needed. They have a double curve, and open at a joint in the middle like a pair of shears. They should be corrugated at the ends of each blade for about two inches, and the face of each blade should have a groove facing its

fellow. These instruments can be used to introduce tents, and also to grasp small pieces of cotton in mopping out the interior of the uterus when the cervix has been dilated or is patulous. They can also be of use in removing larger pieces of retained placenta or fetal remains that have been detached by the curette.

The remaining instruments of importance have already been mentioned in the preceding pages, and illustrations of them are there given. The points of importance in their selection are also given in the text.

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Late Professor of Obstetrics and Diseases of Women and Children in Starling Medical College, Columbus, O.

Revised and Enlarged by CHARLES H. BUSHONG, M.D.,

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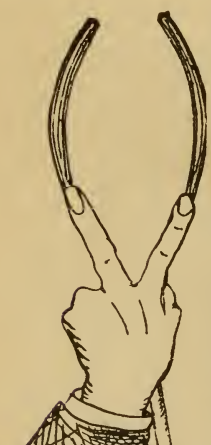

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